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QUARTERLY BULLETIN

BERTRAND BROWN
EDITOR

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HEALTH PLAN FOR THE NATION

IF, as President Roosevelt has said, "the State's paramount concern should be the health of its people," then, in our magnificent planning for an improved social and economic order, we have neglected something essential in the very basis of our future security. For we have so far lamentably failed to establish any well considered plan of health conservation on a nation-wide scale.

The time has come when this failure should be faced frankly and honestly by leaders in medicine and public health to whom the government looks for constructive advice. The President and the Congress should have placed before them a real plan of public health, large in vision, comprehensive in scope, effective as scientific knowledge and administrative experience can make it, and worth a considerable expenditure of money. Such a program should include not merely the control of communicable diseases but the full use of all facilities for prevention of physical and mental impairments, medical and dental care, and social relief. These services—preventive and curative—should be made available to all classes of the population in all communities, not merely to the rich and the indigent nor only in some localities or some areas. By whatever means that are most effective and acceptable, the services of private physicians and medical institutions should be coordinated with those of public health and welfare agencies. The cost of medical care should be defrayed from public funds whenever adequate service cannot be furnished by private facilities and whenever it cannot be paid for by those who need it; and some method of distributing the cost should be devised for the great mass of the population. Physicians and others who render medical and related services should be adequately compensated. Effective integration of local, state, and federal health func-

tions is necessary. Federal aid to states on a considerable scale should be accepted at the very outset as essential. The program must be national in scope.

Is there a real need for this? Why, some may ask, all this bother and expense? Are we not getting along well enough?

Let us consider dispassionately a few of the important aspects of the situation:

(1) In spite of achievements in medicine and public health as manifested in a lowered mortality among infants, children, and younger adults, the death rate among adults of middle and old age has not appreciably diminished. By reason of restrictions upon immigration and the decline in the birth rate, we shall be an older aged people and can no longer afford to impair vitality as we have done in the past. Even the mortality among mothers and infants in a large class of the population of the United States is still far above that in some other countries. The incidence of illness from preventable and curable causes among persons of every age still is disconcertingly great. The high prevalence of preventable and remediable defects and impairments, physical and mental, in all classes, is a sad commentary on the failure to apply the results of medical science.

(2) The actual effects of the economic depression upon the health of the population have not yet been realized nor has their full extent been manifested. The favorable death rate in 1930-1932 is a gratifying indication that public health and curative medicine have been effective in some directions and that relief has prevented deaths, but it is not evidence that national health has attained its highest level. Signs are already accumulating that the American people are not going scot-free from damages to health in this depression. Increased mortality rates, especially from tuberculosis and among infants, and more malnutrition among school children are

appearing in some localities. In other pages of this *Bulletin* appears a preliminary report upon an investigation, undertaken by the United States Public Health Service and the Milbank Memorial Fund, which reveals not only a higher sickness rate among the poor as compared with those more favorably situated, but also to a higher rate among those who have suffered the most marked economic change during the past three or four years. We have been somewhat incredulous over reports of more malnutrition among school children; another report shows that in a sample area in New York City these indications are substantiated by careful physical examinations of children in families affected by the depression. Still another report indicates that deficiencies exist in the diet of unemployed families which were not fortunate enough to be adequately aided by relief agencies. Although it is too soon to appraise the full effects of the depression, a grave situation is gradually being revealed that calls for action.

To cope with conditions such as these, the existing facilities for medical service and health protection are grossly inadequate. Let us face the facts honestly. Briefly summarized without exaggeration, they are as follows:

(a) A very large proportion of the population, as the Committee on the Costs of Medical Care has so clearly shown, cannot receive any medical care whatsoever and an even larger proportion cannot obtain adequate medical care. Facilities for institutional care are lacking in many localities, and a pitiably small number of families have opportunities for diagnosis and preventive treatments. The great majority of American families are unable to meet the sudden costs of severe illness. Under the temporary system of relief, probably more of the poorer families are getting medical care than ever before—a fact which argues eloquently for some systematic handling of the entire problem. A large percent-

age of physicians and others who render medical services receive inadequate incomes even in times of prosperity and their plight is immeasurably worse now.

This is, to put it mildly, an intolerable situation for a country such as ours.

(b) Such methods for developing public health functions in all parts of the nation as have been tried have failed ignominiously. They failed long before the present economic depression. It is only necessary to recall very briefly that in the beginning of the public health movement in the United States, each locality attempted to meet its own problems by such means as sanitation, purification of water supplies, and isolation of cases of communicable diseases. Then it became evident that state-wide measures were necessary and state health departments and boards of health were created. State care of the insane and the tuberculous was established and, in some instances, state aid to local units was provided. Yet a quarter of a century has passed and many states have almost entirely failed to afford even minimal facilities for the protection and promotion of health. The effort to get the federal government to do for public health what it has done for education, agriculture, and roads, so far has been unsuccessful; the niggardly appropriations that were made for rural sanitation and for maternal and infant hygiene have practically ceased, largely because of the opposition of private interests in the field of medicine. Even the limited health functions of the federal government are not integrated and have been subject to internal jealousies and bickerings. Such protection as has been afforded to the wage-earner against hazards of occupation and industrial employment has been achieved all too slowly.

The plain fact is that minimal public health activities were grossly inadequate in a very large part of the area of

the United States even in the heyday of our prosperity. Since 1931, even these facilities have been severely curtailed, especially in those states and areas where the need for health protection is greatest. In forty out of forty-eight states appropriations for public health have been cut. In some states this cut is one half. This has created an acute national public health problem. It is rapidly approaching the dimension of a national health emergency. It can no longer be neglected. The leaders in the public health movement have a responsibility and the President has a right to expect that they will present a health plan to be incorporated in the plan for national recovery.

In the prosecution of a national health program, it is not necessary for new expensive agencies to be created. The existing machinery in the federal and state governments can be utilized and developed if a comprehensive plan is formulated and reasonably adequate federal appropriations are made. Three steps suggest themselves for immediate action:

I. The integration and coordination of all federal health activities under a single head in one department. This could be accomplished at once under the President's direction with such advisers as he may choose. Later it might be advisable to group all social, education, and welfare activities of the federal government into one department with a cabinet member as its head and assistant secretaries for each of the principal fields of interest.

II. The formulation, by the federal head of public health activities, with the counsel of leaders in medicine, public health, and social welfare, of a national plan of public health and medical care, for consideration by the President and the Congress. Such a program should provide for:

1. Coordination of federal, state, and local functions and activities;

2. Training of necessary administrative and scientific personnel;

3. Setting up standards of efficient administration and evaluation of results; and

4. Efficient use of federal, state, and local funds according to needs as determined by health, not political, conditions.

III. Federal appropriations to supplement state and local funds for community health, for medical care of those unable to pay for it, for construction of necessary medical and health facilities where needed, and for education of personnel. The necessity for federal aid cannot be blinked at; it is essential to any effective program. Whatever amount may be estimated as immediately necessary after a careful survey by the federal and state authorities will be almost trifling in comparison with the billions of dollars now being expended for rehabilitation and relief.

No further great advance in the conservation of health can be accomplished unless and until the concept of public health is broad enough to include not merely a limited number of protective measures such as the control of communicable diseases, but all preventive and curative medicine and education in hygiene, as well as efforts to increase the economic security of the people. No real success in translating this concept into action for the country as a whole is likely unless a national health plan is formulated. No nation-wide plan can be effective without the leadership and the financial aid of the federal government.

"Nothing can be more important to a state than its public health," said Franklin D. Roosevelt when he was Governor of a state. That this dictum was more than an eloquent phrase was amply proven by his leadership in formulating a broad program for the future development of public health in

New York. There can be no doubt that he will continue that leadership for the nation. The time is peculiarly opportune for sanitarians and physicians to give him full opportunity and aid.

JOHN A. KINGSBURY

HEALTH ACTIVITIES IN RUSSIA TO BE SURVEYED IN A FORTHCOMING BOOK

"WHEN a Russian becomes ill the Government does something about it . . . . for Soviet Russia has decided that the health of the individual is the concern of society as a whole. Indeed, the Soviet Union is the only nation in the world which has undertaken to set up and operate a complete organization designed to provide preventive and curative medical care for every man, woman, and child within its borders. . . . It may be added that we plead no cause; our only aim is to give a faithful account of what we have seen." With these challenging statements, Sir Arthur Newsholme and John A. Kingsbury preface the joint report of their survey of socialized medicine under the Communist régime. The results of the inquiry will be published in November by Doubleday, Doran and Company, under the title, RED MEDICINE: SOCIALIZED HEALTH IN SOVIET RUSSIA. The volume is over 300 pages in length and has a complete index. The illustrations in this issue of the *Bulletin* are taken from the book.

The investigation was undertaken in 1932 and forms a supplementary chapter in the series of studies on the relation between the private and official practice of medicine in the countries of Western Europe which Sir Arthur Newsholme completed in 1931 and which have been published in three volumes.[1] In a fourth volume[2], Sir Arthur discussed critically the problems involved in the various points of contact be-

[1]Newsholme, Sir Arthur: International Studies on the Relation Between the Private and Official Practice of Medicine, with Special Reference to the Prevention of Disease. (Three volumes.) London, George Allen and Unwin; and Baltimore, The Williams and Wilkins Company, 1931.

[2]Newsholme, Sir Arthur: Medicine and the State. London, George Allen and Unwin; and Baltimore, The Williams and Wilkins Company, 1932.

tween private and public medicine in the countries he studied and drew certain definite conclusions as to future steps to be taken to insure the advance of preventive medicine. Russia was not included in these investigations since there seemed to be no evidence that the Russian experience extending over so comparatively brief a period was likely to give important guidance in pointing the direction and character of advances and reforms needed in American or European communities having a long history of advanced and widely diffused medical and social work. Various readers and reviewers of these earlier volumes, however, questioned the exclusion of Russia, and it was decided to institute a supplementary study of the health activities in the Soviet Republics.

The book is divided into three sections, the first presenting a chronological account of the authors' 9,000-mile journey within the country in making their medical survey, including their general observations about living conditions in modern Russia.

Since any discussion of Russian medical organization is necessarily related to the Soviet political philosophy, the second part of the volume is concerned with the history and evolution of the Soviet Republics, including the physical character of the country; the population; the steps leading to the introduction of Communism; present-day government in the Union of Soviet Socialist Republics; industrial conditions and health; agriculture and agricultural workers; religious and civil liberty; home life; contemporary recreational centers and education; the present status of women under Communism, including the questions of marriage and divorce; and the care of children and youths in Soviet Russia.

While the authors discuss some phases of medical activities in this second section, the final chapters treat in detail the curative and preventive activities, which are all centered

under the government. The subjects discussed include prenatal and postnatal care; abortions and their prevalence; social insurance; public health administration; Russian medical history; medical education; the current medical care of the sick and the characteristics of medical practice in Russia; treatment of illness in nonresidential and residential institutions; the care of tuberculosis; and the treatment and prevention of venereal diseases. The final two chapters present briefly the authors' conception of the basic requirements for a nation-wide health service and contrast this ideal with their evaluation of Russian activities in these fields as influenced by the Soviet type of government.

Sir Arthur and Mr. Kingsbury caution the reader that their description of the Russian accomplishments in medical administration may easily be regarded as giving a distorted and too favorable view of medico-social developments in the country, but point out that while they were undoubtedly shown the best phases of the activities in Russia, the same criticism would hold good of any report by a foreign visitor with influential introductions who had inspected medical and public health work in England or in the United States. They state that they realize fully that they were seeing the best, but add, "when this best was seen repeated in many cities visited by us, and when it was everywhere frankly stated that their arrangements were not yet complete, that the dearth of doctors made more adequate provisions difficult for a few years; and when we were told openly of the great difficulties which were being experienced in extending the medical provisions of cities to the vast rural communities of Russia, and of the only partial success hitherto achieved in overcoming these difficulties, we were forced to the conclusion that we were not being victimized by a 'window-dressing' display; and that, indeed, a marvelous reformed and extended

Diphtheria immunization in Mosc
Margaret Bourke-White Ph

Third Labor Polyclinic in Kharkov, Capital of the Ukrainian Socialist Soviet Republic

Hospital for Government employees in Moscow

Soviet Photo Agency

One of eight new polyclinics in Leningrad

Leningrad Institute for the Protection of

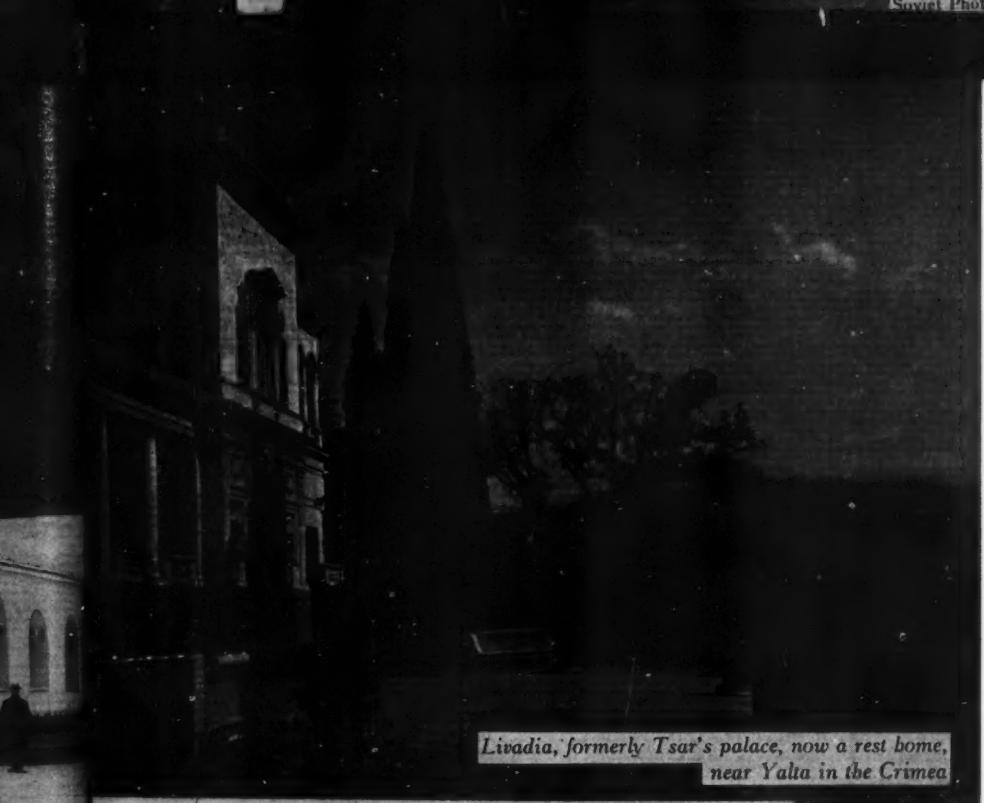
Children in a Moscow crèch
Soviet Photo Agenc

Cardiac sanatorium near Borzhom in the Soviet Socialist Republic of Georgia

Cardiac patients near Borzhom

Margaret Bourke-White, Photo

Soviet Photo Agenc



Livadia, formerly Tsar's palace, now a rest home, near Yalta in the Crimea

An example of the new type of tuberculosis sanatoria

Tuberculosis Institute at Tiflis, Capital of the Soviet Socialist Republic of Georgia

medical service had been organized in Russia, the methods and procedures of which the rest of the world would do well to study."

The authors emphasize the fact that the entire practice of medicine, institutional and domiciliary, having been socialized, is supervised and controlled by the public health organization in each of the seven constituent republics. In this respect, there is no separation between clinical and preventive medicine. Each doctor is expected to consider the health of his patient, not merely as a patient, but as a member of the community, whose efficiency, if possible, must be increased.

Every doctor is a state official, and in most instances exclusively so, although there is no legal restriction against private practice. A few doctors, especially older doctors or physicians who have acquired special reputations still retain some private individual practice; but their number is diminishing, and practically all the younger doctors are exclusively officials of the State, largely, in the opinion of officials, because the element of profit has been almost entirely eliminated from national and private affairs.

Next in significance to the fact that every doctor in Soviet Russia is a State official, the authors believe, is the concentration of medical practice in dispensaries, polyclinics, and hospitals, in which the individual doctor is never an isolated unit, but is in systematic touch with every branch of medicine. In this unified medical organization the next link after the home doctor and the factory doctor is constituted by dispensaries and polyclinics. It is claimed by the health officials, the authors state, that, by the partial and almost complete "dispensarization" of medical practice, supervision is being exercised over the healthy as well as the sick persons in each district, including not only workers and their families,

but the entire population; and that there is an almost complete integration of both preventive and curative medicine with little redundance or deficiency of service, and with exact linking up of domiciliary and institutional, including expert, services. To quote but one of the numerous descriptions of the work in the dispensaries, cited by the authors:

> "The best example of polyclinic organization and equipment was seen in Rostov-on-Don, at the Unitary Dispensary. The institution so-called is the chief polyclinic in the city, admirably equipped in all special departments of medicine, and with a staff in each department which includes the university professors of medicine. Medical students are trained here and are required also to attend at ambulatoria.
>
> "There are four dispensaries or ambulatoria attached to the polyclinic, in which ordinary cases are treated. There are also night sanatoria for patients with stomachic diseases, where the patients sleep, are given appropriate food, and from which they go to their daily work. There is a similar institution for nervous cases.
>
> "There is a special venereal disease centre for treatment, with a branch at the polyclinic.
>
> "Recently a department has been opened for the treatment of alcoholics, with arrangements for anti-alcoholic addresses.
>
> "At this polyclinic about 1,800 patients are treated daily. All diseases are treated, including formerly tuberculosis; but for this disease it has been found more convenient to use the tuberculosis sections of the clinic chiefly for consultation in difficult cases sent from other institutions.
>
> "All the documents relating to the patient are collected and kept. Thus a tuberculous patient is treated with complete medical knowledge of his condition. During the last three years, we were told, a Tuberculosis Care Committee had been meeting every ten days. In this committee are included the patient's doctor at the polyclinic, and the doctor

from the ambulatorium who knows the conditions of his daily work. The future conditions of his patient's working are determined, the deficiency in his wage created by his partial inability being paid by the insurance bureau. He remains under the supervision of the ambulatorium doctor and of the doctor at the factory where he works. Workers take great interest in this branch of health work and the committees of workmen concerned with it.

"The polyclinic serves a section of the city having a population of some 25,000. Its area is divided into twelve sub-districts, each of which has a doctor allotted to it. He has charge of about 2,100 people. He may live where he likes, not necessarily in the district allotted to him. He is an employee of the dispensary of his district and spends part of each working day there. He may also be the school doctor for the school in his sub-district. He has sanitary supervision of those living in his area, and gives addresses on health problems to the people."

The authors review in some detail the provisions for the care of tuberculosis, describing institutions in Samara, Tiflis, Moscow, Kharkov, Leningrad, and Yalta. They were greatly impressed by the almost lavish provision of rest homes, convalescent homes, and sanatoria, largely for the care of tuberculous patients. "There are now 24 tuberculosis dispensaries in Moscow with 226 full-time physicians," they state. "In 1931, 776,000 patients were treated, 90,000 of whom came for the first time. Only 30,000 of the last-named number proved to be tuberculous. . . . In tuberculosis dispensaries various forms of special treatment are given, including the production of pneumothorax. . . . The first choice in securing institutional treatment is always given to workers. . . . Contacts are watched, especially children, and examinations made every three to six months; for children tuberculin tests and X-rays are employed."

They found that there is institutional treatment for approx-

imately 100 per cent of the "open" cases of tuberculosis in the towns, and that while before the Revolution there were but 350 beds for tuberculous patients in all Russia, there are now 35,000, and in addition there are some 12,000 beds in day sanatoria and night sanatoria. These sanatoria are usually attached to a dispensary, and make provision for many patients who may be working in one of the Soviet factories. No charge is made for treatment.

In a summarizing chapter, Sir Arthur and Mr. Kingsbury discuss the leading characteristics of Russian medicine. In this summary they reemphasize that much of their survey is concerned with the medical facilities provided in cities, and that they were repeatedly informed that there is an inadequate supply of doctors for the needs of both the city dwellers and the immense and widely scattered rural population, but that this deficiency is being rapidly overcome. They again state that the two outstanding characteristics are: "First, every doctor, with negligible exceptions, is an official of the State, and second, there is a remarkable concentration of medical practice in coordinated institutions, which ensures that every doctor has ready and daily access to expert and institutional help as it may be needed."

Another feature, perhaps the guiding principle, is that the new service is made available in a special degree to all industrial workers and the poorest of the peasants, and to their families. Workers are given priority of treatment at the various dispensaries and polyclinics and have the first call on hospital beds and on treatment in sanatoria and convalescent homes. But although priority is given to the workers, treatment is not withheld from those who do not come within the category of workers.

A further feature is that there is but one national system for the entire population in each republic. In the main, also,

the treatment of disease is entirely gratuitous to those receiving it. Its cost is defrayed by governmental funds, which are derived chiefly from the pursuit of its monopolistic industries.

In conclusion the authors say, "In some essential particulars, the Union of Soviet Socialist Republics has surpassed all other countries in its socialization of medicine. It has removed the doctor almost entirely from the field of monetary competition, and has thus abolished a chief source of inadequate medical service. It has made a gratuitous (that is, state-paid) medical service of an astonishingly complete character promptly available for the vast majority of urban populations, a service which is being rapidly extended to rural Russia; and it has given the whole of this service an admirable turn in the direction of social as well as medical preventive measures.

"It has constituted a single unit system of medical service for the population, freed from the complications, overlappings, and gaps of western medicine. However, the occurrence of gaps in the service for rural Russia is admitted.

"These are great achievements. The new arrangements are far from perfect; but perfection could not be expected after only a dozen years of strenuous organization. But other countries may well envy Soviet Russia's elaborately centralized government in this respect, in that it has been able to brush aside all past complexities and to initiate a nearly universal national medical service on unified lines, untrammeled by such complications as exist in western Europe and America. There are some advantages in starting, as Russia has done, almost from zero point; but the realization of unification and of universality of a satisfactory medical service, available for all who cannot now afford it, should not be beyond the reach of other countries.

"In every civilized country medicine has become more than

half socialized. There is more hospital and institutional treatment of illness (including insanity) than domiciliary treatment. Much domiciliary treatment is partially or entirely a state or municipal service, including the various sickness insurance schemes; and except in Britain and America nearly all hospital treatment is a state service. Even in these two countries it is to a very great extent a state service.

"What Russia has accomplished in its courageously original schemes for the health and social well-being of its people constitutes a challenge to other countries . . . a challenge which western civilization must accept and meet."

HEALTH AND THE DEPRESSION

by EDGAR SYDENSTRICKER

WHAT effects is the economic depression having upon the health of the American people?

The indices of health—or rather of ill health—upon which we ordinarily rely have pointed so far to a condition that is surprising to many. After several years of severe economic stress, the gross death rate has attained the lowest level on record. Infant and tuberculosis mortality have not increased in the country as a whole; on the contrary they have continued to decline. These encouraging indications have led to considerable speculation on the part of some as to the possible advantages of "tightening the belt" during hard times, of returning to "simpler and saner living," of the "toughening" regimen of adversity. Others have offered the explanation that any ill effects have been prevented by a marvelously efficient public health system and program of social relief, and are concerned chiefly over the possibility of a breakdown in these efforts before necessary economic readjustments can be completed.

Whatever may be the reasons for a low death rate during an unusually severe economic depression, the fact that the death rate has continued on a low level must be accepted as a most encouraging sign. It is indubitable evidence that up to this time unemployment, diminished purchasing power, altered standards of living, even privation, have not *killed* very many of the population. But this indication should be accepted only in so far as it really is a sign of good health. The death rate is not an adequate criterion of the extent of sickness and impairment. It is not affected immediately by unfavorable living conditions unless starvation and pestilence are actually present. It does not promptly reveal de-

creased resistance to disease. It is not an accurate measure, for example, of malnutrition. Furthermore, the gross mortality rate for the nation as a whole or for any large group of the population does not tell whether or not certain elements of the population are suffering from ill health; the actual increase in illness and mortality among that fraction which has been reduced to poverty by the depression may be masked by the general downward trend of the mortality among the more fortunate and larger moiety of the population. In fact, fragmentary information[1] already gives a hint of warning that in certain areas and among certain classes of the population, the situation is not nearly so favorable as gross mortality rates appear to show. Malnutrition among school children apparently has increased, in some localities at least. A higher infant and tuberculosis mortality has been experienced in certain areas of New York City where unemployment was most serious. Signs of an increase in the number of cases of mental disease are not lacking. Already there is some evidence that the sickness rate has risen among the unemployed population, especially in those instances where social relief has been unequal to the situation.

These indications of an unfavorable tenor, as well as the

[1]See, for example, *Weekly Bulletin* of the Department of Health of New York City, November 26, 1932; Slevin, J. G., M.D.: Some Physical and Social Aspects of Malnutrition in School Children. *Journal of the Michigan State Medical Society*, January, 1933; Jacobs, Esther: Is Malnutrition Increasing? *American Journal of Public Health*, August, 1933; *Illinois Health Messenger*, Springfield, Illinois, June 1, 1933; Berry, Gwendolyn Hughes: Illness and the Health of a Neighborhood—A Social Study of the Mulberry District (N. Y.). New York Association for Improving the Condition of the Poor, 1933; Health Conditions in New York City (mimeographed report); Committee on Neighborhood Health Development, New York City; Some Effects of the Depression on the Nutrition of Children (mimeographed report). Children's Bureau, United States Department of Labor: *Child Welfare News Summary*, July 12, 1933; The Economic Depression and Public Health, memorandum prepared by the Health Section, *Quarterly Bulletin* of the Health Organization, League of Nations, September, 1932.

obvious desirability of appraising the situation as accurately as possible, led Surgeon-General Hugh S. Cumming of the United States Public Health Service to direct an inquiry to be made into the prevalence of sickness and malnutrition and into changes in economic status and standards of living in sample populations that are known to be seriously affected by unemployment. The purpose of this inquiry was to obtain first-hand information in order that such questions as the following might be answered:

Are the unemployed and their families subject to an unusual amount of sickness of various kinds as compared with other groups less severely affected? Do evidences of ill health show any relation to the severity of the depression as actually experienced by families? What is the nature of ill health as evidenced by sickness? Is malnutrition among children a more serious problem now than a few years ago, and if so, in what groups of the population is it most pressing? What have been the effects of the depression upon housing and diet? Is there a decrease in the amount of medical and

ECONOMY AND HEALTH

by WILLIAM H. WELCH, M.D.

Dean of American Medicine, in a Speech before the Advisory Council, Milbank Memorial Fund

ANY undue retrenchment in health work is bound to be paid for in dollars and cents as well as in the impairment of the people's health generally. We can demonstrate convincingly that returns in economic and social welfare from expenditures for public health service are far in excess of their costs.

Too great economy as far as health is concerned, because of the current depression, is particularly dangerous to the welfare of growing children. Undernourishment of children, for example, is not likely to show itself immediately, but is bound to show its effects later, when it is probably too late to remedy. The ground lost by undernourishment in childhood may never be regained.

—THE NEW YORK TIMES (*New York*), March 20, 1932

surgical care available to families seriously affected? How successful have been social relief and public health in coping with the consequences of the depression?

The inquiry possesses an added significance because it is coordinated with similar inquiries in several other countries under the auspices of the International Health Organization of the League of Nations.[2] Along the general lines suggested by experts of and collaborating with the League's Health Section, the investigation was planned to cover four important phases:

1. A record of illness in the late spring of 1933 and of mortality in 10,000 or more families, selected from the lower economic classes of the population, which could be correlated with their economic experience during the period 1929-1932.

2. A survey of diet and housing conditions among sample families selected from the population for whom a record of illness and economic history was secured.

3. Physical examinations of school children in sample families selected from the same group in at least two of the cities.

4. An analysis of mortality experience during the depression, particularly in localities where the records are available by health areas, enumeration districts, or other suitable subdivisions.

[2]See *Minutes* of the 19th session, Health Committee, Health Organization, League of Nations, Geneva, October 10th to 15th, 1932; Report of the Conference at Berlin, December 5th to 7th, 1932, on The Most Suitable Methods of Detecting Malnutrition Due to the Economic Depression, *Quarterly Bulletin* of the Health Organization, League of Nations, March, 1932, pp. 116-129. The statistical committee representing the United States named by Surgeon-General Cumming to collaborate with the League is composed of Edgar Sydenstricker, Louis I. Dublin, Walter F. Willcox, and Selwyn D. Collins. In 1932, two American representatives, Drs. John R. Murlin and Kenneth D. Blackfan, named by Dr. Cumming, were sent by the Milbank Memorial Fund to attend an international conference at Berlin to discuss and formulate plans for inquiries into the nutritional status of children during the depression.

Since most of these records had to be obtained from house-to-house canvass, the inquiry was a large undertaking. Lack of funds and personnel limited the survey to ten localities but it was believed that whatever definite indications were found in these localities would be fairly representative of the situation in similar populations in the rest of the country. In order to facilitate the study and to enlarge its scope to include the ten localities, the Milbank Memorial Fund placed several of its staff at the disposal of the United States Public Health Service and rendered financial assistance for purposes for which government appropriations were not available. The project has been a collaborative undertaking on the part of the research and field staffs of the Service and the Fund, and furnishes another example of useful cooperation between official and private agencies in rendering a public service.

The collection of the data has been completed and the arduous task of tabulating the results is under way. With Surgeon-General Cumming's concurrence, it is possible to present some preliminary and partial results of the study in the three brief reports which appear in the following pages of this issue of the *Quarterly Bulletin*.

The reader is referred to the extremely interesting papers for details but some short general comment may be pertinent:

If the incidence of sickness may be accepted as a more delicate index of ill health than mortality, the surveys in Birmingham, Detroit, and Pittsburgh, as reported by G. St.J. Perrott and Dr. Selwyn D. Collins, clearly point to the fact that individuals in the lower income classes in 1932 were sick more frequently than individuals with higher incomes. This fact is manifested for each of the three cities. But, as is well known, this correlation between sickness and ill health is not confined to periods of depression; it is obviously desirable, therefore, to ascertain whether or not the higher sick-

ness rate among the poorer classes was in any way associated with *changes* in their standard of living due to the depression. The next very significant and interesting point is brought out that the highest sickness rate was found in the group whose economic condition had manifested the greatest change downward from 1929 to 1932. The illness rate was 60 per cent higher among persons whose economic status had dropped from that of reasonably comfortable circumstances in 1929 to poverty in 1932 than that of their more fortunate neighbors who suffered no drop in income. In fact, those individuals who were in a condition of poverty in 1929 and continued in that condition through 1932 apparently had less sickness than the higher income group which suffered most severely from the depression—a finding that immediately tempts one to speculate as to the underlying reasons. The direct effect of unemployment is suggested by the fact that the sickness rate in families of the unemployed was about 40 per cent higher than in the group having full-time wage-earners. All of these comparisons apply to total sickness, disabling illnesses, as well as illness resulting in confinement to bed.

Physical examinations of several hundred school children in the Bellevue district of New York City, conducted by physicians from the New York City Health Department, the United States Public Health Service and the Milbank Fund, and reported upon by Dr. Clyde V. Kiser and Dr. Regine K. Stix, showed that in this area, which was seriously affected by the depression, a high rate of malnutrition existed in the late spring of 1933. The children were selected from families included in the sickness and economic survey but the examining physicians had no information as to their economic status or the extent to which the families had been affected by the depression. Only about 25 per cent were rated

as "good" in nutrition and about 35 per cent were rated as "poor" or worse. When the children were later classified according to family income, it was found that for each sex and age group there was a consistent direct association between nutrition and low economic status. Over 40 per cent of those in the lowest income class were judged as "poor" and "very poor" in nutrition as compared with only 25 per cent in the highest income class—which, by the way, was not very high. Furthermore, when the nutrition of children in families suffering the greatest drop in income during the depression is compared with that of children in families not so seriously affected, it was found that the extent of malnutrition in the former group was nearly twice as high as that in the latter. Children in families without social relief were found to have a higher rate of malnutrition than similar families aided by relief.

A preliminary computation by Miss Dorothy G. Wiehl of the average diets of several hundred families in the Bellevue area clearly suggests that a dietary deficiency, at least in the calorific value and probably in certain food essentials, existed in families most seriously affected by the depression as compared with families less seriously affected. Here again, the efficiency of relief activities is indicated. Families aided by relief funds, particularly when relief took the form of stipulated orders of specific foods, had a better diet than unemployed families without relief.

Although these are but preliminary and fragmentary results from only a part of the large mass of data now being analyzed in greater detail, they are consistent and significant. They tend to corroborate what those in close touch with the large unemployed part of our population have observed, that privation is having deleterious effects upon the health of many. How serious and how lasting these effects will be,

it is as yet impossible to say, but such indications as this study so far affords should at least constitute a warning against the complacency fostered by too complete reliance upon so crude an index of health as the death rate, and against any relaxation in the maintenance of preventive and relief measures.

SICKNESS AND THE DEPRESSION[1]

A PRELIMINARY REPORT UPON A SURVEY OF WAGE-EARNING FAMILIES IN BIRMINGHAM, DETROIT, AND PITTSBURGH

by G. St.J. Perrott and Selwyn D. Collins

THE ordinary barometers of ill health—death rates and reports of communicable diseases—do not indicate that harmful effects of the depression upon the health of the population as a whole have taken place. The comfortable conclusion is drawn by many that the physical well-being of the American people not only has not suffered but, in view of the continued decline in mortality, may have been benefited, by the economic catastrophe.

Such a conclusion, based upon mortality statistics alone, obviously is open to question. Death rates are not sensitive indices of the immediate effects of deleterious conditions. Even if they were, existing mortality and population records are not available in such form as to yield the very essential information as to whether any economic group has experienced a higher mortality than other groups. What we need, in appraising the depression's cost in ill health, are more efficient indices of physical and mental impairment in order to determine whether or not population groups whose economic status was most severely affected are suffering damages to health and what the nature and extent of these damages are. Only in this way can reasonably accurate appraisal be made.

Among the now well recognized indices of ill health are records of sickness. When properly obtained and analyzed, they reveal some of the reactions of human beings to imme-

[1]From the Office of Statistical Investigations, United States Public Health Service, and the Division of Research, Milbank Memorial Fund. A large part of this paper appears also in the Public Health Reports for October 13, 1933

diate environmental factors in a far more sensitive degree than the gross death rate or even mortality by cause can possibly do. Since no national system for the registration of sickness exists, special records must be collected, a difficulty not without its advantages since it permits information to be obtained for such groups and in such detail as may be desired. One phase of the study of health and the depression by the United States Public Health Service and the Milbank Memorial Fund utilized this method extensively. A sickness and mortality survey was made in 1933 of some 12,000 wage-earning families which had suffered from the depression in varying degrees of severity. Among the more important specific purposes of the survey were the following:

1. To ascertain whether or not there is any association between income changes during the depression and ill health as measured by morbidity and mortality.
2. If such an association exists, to discover what kinds of sickness and causes of death are chiefly responsible for the association.
3. To determine the amount and kinds of medical care received by various economic classes of the people.

Ten localities were included in the survey. The present paper gives some of the preliminary results for the first three cities for which tabulations have been made—Birmingham, Detroit, and Pittsburgh.

METHOD AND SCOPE OF THE STUDY

Selection of Localities. Large cities were selected for the survey, with two exceptions, because unemployment and the privation incident to unemployment were known to be greater in the such places. Eight cities were selected as follows: (1) New York, (2) Brooklyn, (3) Syracuse, (4) Pittsburgh, (5) Detroit, (6) Cleveland, (7) Baltimore, and (8) Birmingham.

In addition, a survey was made in a number of coal-mining camps in the vicinity of Morgantown, West Virginia, and in cotton-mill villages near Greenville, South Carolina. In the ten localities about 12,000 families were enumerated.

Selection of Families. Districts were selected in the poorer sections of the cities. Well-to-do sections were avoided because the dwellers in these areas, however much their incomes may have decreased, were presumably living above any scale that might involve real deprivation of the things necessary to health. On the other hand, slum areas were also avoided. The survey was interested mainly in individuals who were unemployed and on restricted incomes because of the depression, as distinguished from those of the "unemployable" type who are subjects for charity in both good and bad times.

Living side by side with families of the unemployed were families, even in these poor districts, who were still in reasonably comfortable circumstances, that is, had apparently adequate food, clothing, and shelter. These "comfortable" families serve as a control group whose illness record can be compared with that of families in a state of comparative poverty for one or more years prior to the survey. It should be emphasized that in the selected districts every family was included unless the information was refused and refusals were exceedingly rare.

Nature of Information Obtained. The information called for in the inquiry included: (a) occupation, income, and regularity of employment of each wage-earner for each year from 1929 to 1932, as well as family income from sources other than wages; (b) nativity, racial stock, and education of husband and wife; (c) a complete census of the household with birth date, sex, and marital status of each member; (d) illness of each member during the three months prior to

the enumerator's visit, together with the extent of medical, hospital, nursing, and dental care.

Method of Obtaining the Information. For each city, a local supervisor was assigned by the Public Health Service or the Milbank Fund. The supervisors were already experienced in the collection and tabulation of data of the kind here considered, but to secure accuracy and uniformity they were given an intensive training in the meaning of the items on this schedule and the methods of recording the data.

Enumerators were hired locally. It was possible to secure very capable men and women for the work, partly because of the prevailing economic conditions. The enumerators were given a preliminary period of training to familiarize them with the schedule and were taken by the local supervisor to interview several families before making any visits alone. They were instructed and encouraged to be thorough rather than rapid in their work.

Both the supervisor and the enumerators worked under written instructions so that the surveys would be done in as comparable a manner as possible in all cities. In addition, one of us (G.S.P.) acted as a general supervisor and visited all but two of the communities either to start the work (select districts, enumerators, et cetera) or to check the selections made by the local supervisor.

THE POPULATION SURVEYED

Number. In the three cities included in this preliminary paper, schedules were obtained from about 3,500 white families. The families here considered are those for which the employment and wage record and other income facts were sufficiently complete to permit the computation of fairly exact incomes for each year from 1929 to 1932, and for which other information was reasonably complete. There were 2,566 families, including 11,330 individuals.

Occupational Composition. The population was largely of the wage-earning class. The usual occupation of the chief wage-earner in 1929 was that of skilled laborer in 59 per cent of the families; unskilled, 19 per cent; clerical and salesmen, 13 per cent; dealers, merchants, et cetera, 7 per cent; professional, 2 per cent. In 1932, in 18 per cent of the families, the chief wage-earner was without employment throughout the year.

Considering all the wage-earners in the family, the data show that in 1929 only one per cent of the families had no employed workers, 16 per cent had only part-time workers, and 83 per cent had one or more full-time workers. In 1932, the percentages were 12 per cent with no employed workers, 40 per cent with part-time workers only, and 48 per cent with full-time workers. The same downward change is evident here as in the per capita and family income, one, of course, being the cause of the other.

Nativity and Racial Stock. In 54 per cent of the families, the household head was native white of native parents; in 14 per cent, of foreign or mixed parents; and in 32 per cent, foreign born. The racial stock of the group of foreign or mixed parents was largely English, Irish, and German, while that of the foreign-born group was more evenly distributed among English, Irish, Italian, Polish, and Slavic.

ECONOMIC HISTORY OF FAMILIES, 1929–1932

Meaning of Income. Income as computed in this study includes all receipts from any source—salary, royalties, interest, pension, savings, borrowed funds, gifts, and public and private relief. In the case of families given a weekly food ticket from welfare institutions, its value was included in the family income. Free or unpaid rent was not included because of incomplete data on this item.

Family Incomes in 1929 and 1932. No attempt was made to select districts in which the income distribution of the surveyed families would be representative of the cities as a whole. The plan, as already outlined, was to include sections having families who, in normal times, were in moderate circumstances but who, in large numbers, had been reduced to poverty or near poverty during the depression. A rough idea of the income distribution of the surveyed group in 1929 and 1932 as compared with large cities and the entire United States may be obtained from Table 1.

It will be seen that even in 1929 the surveyed population as compared with the total population of large cities contained a considerable excess of families below $1,200 in annual income (25 per cent as compared with 7 per cent) and a deficiency of families over $3,000 (18 per cent as compared with 39 per cent). The closer agreement with the estimate for the United States in 1928 is simply fortuitous. The total population of the United States contains a larger proportion of low incomes than the population in cities of 100,000 or

Table 1. Percentage distribution according to total income of families (1) in the surveyed population for 1929 and 1932, (2) as estimated for all cities of 100,000 and over and (3) as estimated for the United States.

Total Family Income per Annum	Surveyed Group in Birmingham, Detroit, and Pittsburgh		Cities of 100,000 and over[1] in United States, 1928–1931	United States 1928[2]
	1929	1932		
Under $1,200	25.2	69.3	7	21.3
$1,200–$2,000	34.5	21.6	27	34.0
$2,000–$3,000	22.7	7.0	27	21.5
$3,000 and over	17.6	2.1	39	23.2
Total	100.0	100.0	100	100.0

[1]Falk, I. S.; Klem, Margaret C.; and Sinai, Nathan: The Incidence of Illness and the Receipt and Costs of Medical Care among Representative Families. Publication No. 26, Committee on the Costs of Medical Care. Chicago, University of Chicago Press.

[2]Reed, Louis S.: The Ability to Pay for Medical Care. Publication No. 25, Committee on the Costs of Medical Care. Chicago, University of Chicago Press.

more inhabitants because of the dwellers in small towns and rural areas where money income, and the general level of prices are lower. Negroes are also a low-income group that live largely in rural areas.

The table shows also the tremendous drop in income experienced by the surveyed population from 1929 to 1932. In 1932, 69 per cent of the families received incomes less than $1,200 per year as compared with 25 per cent in 1929. Only 9 per cent of the families had incomes over $2,000 in 1932 as compared with 40 per cent in 1929.

Per Capita Income Changes. For the purposes of this investigation, family income per capita was used as the basis of classifying the households because it was felt that this represented economic status better than the total family income which takes no account of size of family. It was realized that

Table 2. Distribution of the surveyed population according to annual family income per capita in Birmingham, Detroit, and Pittsburgh, for the years 1929 to 1932.

Annual Family Income per Capita	1929		1930		1931		1932	
	Number of Persons	Percentage of Persons	Number of Persons	Percentage of Persons	Number of Persons	Percentage of Persons	Number of Persons	Percentage of Persons
"Poor"								
Under $50	123	1.1	338	3.0	657	5.8	1,366	12.1
$50- 99	401	3.5 } 10.3	925	8.2 } 19.2	1,426	12.6 } 29.0	2,236	19.7 } 45.1
$100–149	645	5.7	912	8.0	1,197	10.6	1,506	13.3
"Moderate"								
$150–199	726	6.4	1,052	9.3	1,442	12.7	1,312	11.6
$200–249	882	7.8	861	7.6	1,121	9.9	1,178	10.4
$250–299	917	8.1 } 42.6	1,027	9.2 } 46.3	926	8.2 } 47.1	815	7.2 } 41.6
$300–349	1,068	9.4	1,062	9.3	901	7.9	717	6.3
$350–424	1,230	10.9	1,241	10.9	949	8.4	693	6.1
"Comfortable"								
$425–499	1,200	10.6	880	7.8	708	6.3	506	4.5
$500–749	2,390	21.1 } 47.1	1,876	16.5 } 34.5	1,363	12.0 } 23.9	709	6.2 } 13.3
$750 and over	1,748	15.4	1,156	10.2	640	5.6	292	2.6
Total	11,330	100.0	11,330	100.0	11,330	100.0	11,330	100.0

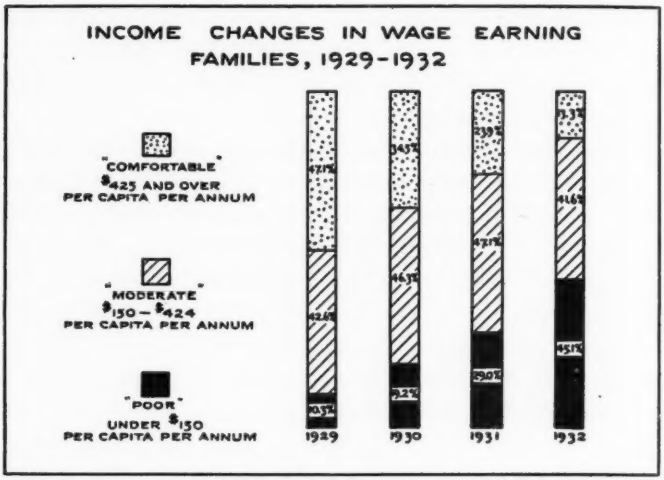

INCOME CHANGES IN WAGE EARNING FAMILIES, 1929-1932
"COMFORTABLE" $425 AND OVER PER CAPITA PER ANNUM
"MODERATE" $150 – $424 PER CAPITA PER ANNUM
"POOR" UNDER $150 PER CAPITA PER ANNUM
1929
1930
1931
1932

Fig. 1. Percentage distribution of the surveyed population according to annual family income per capita for each of the years 1929-1932. The population includes 11,330 individuals in 2,566 families in Birmingham, Detroit, and Pittsburgh.

for strict accuracy, a figure-taking account of not only the size of the family but also the age and sex of its members, such as "income per adult male unit," might be better than income per capita. However, previous studies have shown close correlation between per capita income and these other derived units and it was felt that the accuracy of the four-year income record was not sufficient to justify the more refined calculations.

Table 2 and Figure 1 show the population grouped according to annual per capita income for the years 1929 to 1932. For convenience in discussion, the individual income classes have been combined into three groups and designated as follows:

"POOR" — Under $150 per capita per year
"MODERATE" — $150–$424 per capita per year
"COMFORTABLE" — $425 and over per capita per year

These names have no significance other than as convenient labels indicating a rising scale of per capita income.

It will be seen that the "poor" group (income less than $150 per capita) constituted only 10 per cent of the total in 1929 but rose to 45 per cent in 1932, while the group with "comfortable" income ($425 or more per capita) dropped from 47 per cent of the total in 1929 to 13 per cent in 1932. The percentage in the "moderate" class ($150-$424) did not change greatly. This does not mean that individuals in this group in 1929 suffered no diminution in income during succeeding years, but that as some dropped into the low-income group, others from the higher class took their places.

The change from one income class to another is better shown in Figure 2 where the income history of the three groups of individuals in 1929 is traced through each year to 1933. It is seen that only about one-fourth of the individuals in families comfortably off in 1929 retained that status in 1932 and nearly an equal number had become poor. Over half of those in moderate circumstances in 1929 had fallen into the "poor" category by 1932. Nine out of ten persons classified as "poor" in 1929 remained in that class throughout the period. Obviously very few persons enjoyed an increasing income during the depression and a very large percentage suffered a drop in income.

The chart (Fig. 2) suggests a method of classifying the families for purposes of comparing illness rates into groups having different types of economic history during the depression. Two broad groups might be made: (1) families suffering no material change of income from 1929 to 1932; (2) families whose income changed between 1929 and 1932. Class 1 can be further divided into (a) comfortable, 1929-1932; (b) moderate, 1929-1932; and (c) poor, 1929-1932. Class 2, disregarding the relatively few families whose incomes rose or

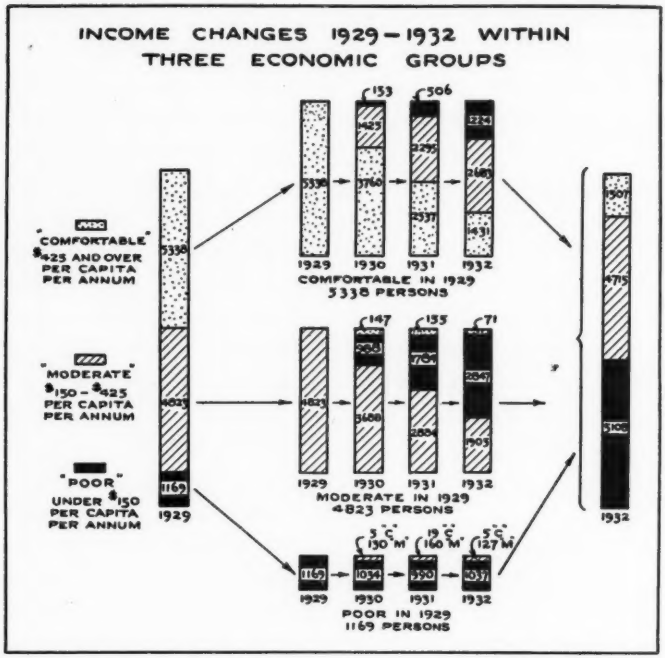


Fig. 2. Annual shifts (1930-1932) in number of individuals in each of three broad income classes of family income per capita in 1929. (11,330 persons in 2,566 families in Birmingham, Detroit, and Pittsburgh.)

The chart is designed to show graphically how families changed from one income class to another during the three years following 1929.

Thus, it is seen that of the 5,338 individuals who were comfortable (per capita income of $425 or more) in 1929, 3,760, or 70 per cent, had this income in 1930; 2,537, or 48 per cent, in 1931; and only 1,431, or 27 per cent, were still "comfortable" in 1932. This drop in the number in the comfortable group of 1929 was made up of 2,683, or 50 per cent, who had dropped to the "moderate" class ($150-424) by 1932 and 1,224, or 23 per cent, who had dropped to the "poor" group (under $150).

In the same way, the history may be followed of the 4,823 individuals in the "moderate" income group in 1929. By 1932, only 1,905, or 40 per cent, of these were still in the "moderate" group, 2,847, or 59 per cent, had fallen into the "poor" group, and only 71, or one per cent, had risen to the "comfortable" group.

Of the 1,169 who were "poor" in 1929, 127, or 11 per cent, had risen to "moderate" circumstances in 1932, and only 5 persons (one family) to "comfortable" circumstances. The other 89 per cent remained "poor" in 1932.

oscillated up and down, could be divided into a large number of groups each defined by an economic status rating and the time the family experienced that status. For example, we might have families with a depression history as follows: (1) comfortable, 1929; poor, 1930, 1931, 1932; (2) comfortable, 1929, 1930; poor, 1931, 1932; and so on. The number of groups feasible to use in a sickness study obviously depends upon the size of the population being studied. In the present report, which covers only 11,000 individuals, a few of these groups have been used to describe the depression experience or history in a manner as specific as possible without giving too small a population to be significant for statistical study. As other cities are added to the tabulations, depression history groups will be made increasingly specific.

ILLNESS AND 1932 INCOME

Inquiry was made about illness from all diseases and accidents, including mild as well as severe cases. What was included as illness was to a considerable extent a matter of what the informant (usually the housewife) remembered and designated as such. Hence the records of disabling cases are probably better measures of real sickness than are the total cases, because the disabling illnesses are more likely to be accurately and completely reported. A case sufficiently severe to be disabling or confine the individual to his bed within three months of the interview is very likely to be remembered while many of the minor ailments are forgotten and are consequently not mentioned to the enumerator.

Illnesses are classified as having (1) onset within the survey period, and (2) onset prior to the survey period. Each of these groups is shown as (a) all cases, (b) disabling cases, consisting of those causing inability to carry on their usual activities, and (c) cases in which the patient was confined to bed for

one or more days. All bed cases are included in the disabling class.

The illness rates are for the three-month period of the survey and are not reduced to an annual basis. The "survey period" refers to the three months prior to the enumerator's visit; it is the period of time for which illness data were recorded.[2]

In Table 3 and Figure 3 the incidence of illness is shown for four groups of the surveyed population classified according to annual per capita income in 1932 to show the relation between economic status and illness as it was found in 1933. Inspection of the table and graph shows a lower illness rate[3]

Table 3. Illness and 1932 income. Incidence of illness as related to 1932 family income per capita in canvassed white families in Birmingham, Detroit, and Pittsburgh. The group comprised 2,566 families, including 11,330 individuals.

Annual Family Income per Capita in 1932	Illness Rate per 1,000 Persons for 3 Months Survey Period[1]						Population Observed
	Onset within Period			Onset prior to period			
	Total	Disabling	Bed	Total	Disabling	Bed	
Under $150	151	103	94	75	44	32	5,108
$150–$249	143	104	94	66	38	31	2,490
$250–$424	136	84	74	70	43	33	2,225
$425 and over	127	77	64	85	46	32	1,507

[1]The survey period refers to the three months prior to the enumerator's visit. The canvass in each city required from three to four weeks. The dates of the canvass were slightly different in each city but were between March 20, 1933 and May 15, 1933 for all three cities.

[2]See footnote to Table 3 for calendar months included, et cetera.

[3]Crude rates are given in this report although it is fully realized that crude rates in vital statistics often give rise to erroneous conclusions. Three possible sources of error in the present study occur to the writers: (1) variation in age distribution in the different income and "depression history" groups; (2) variation in family size in these groups (illnesses may not be completely reported

(continued on page 293)

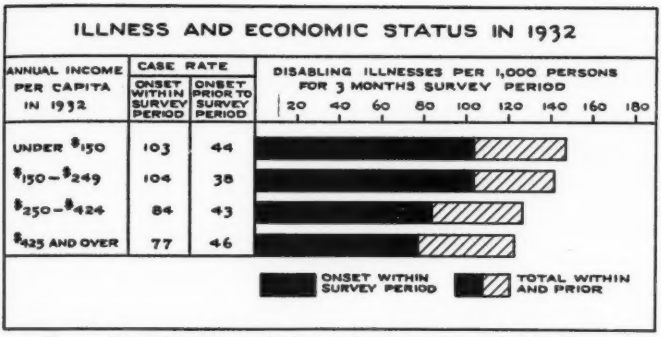

ILLNESS AND ECONOMIC STATUS IN 1932
ANNUAL INCOME PER CAPITA IN 1932
CASE RATE
ONSET WITHIN SURVEY PERIOD
ONSET PRIOR TO SURVEY PERIOD
DISABLING ILLNESSES PER 1,000 PERSONS FOR 3 MONTHS SURVEY PERIOD
20 40 60 80 100 120 140 160 180
UNDER $150 103 44
$150–$249 104 38
$250–$424 84 43
$425 AND OVER 77 46
ONSET WITHIN SURVEY PERIOD
TOTAL WITHIN AND PRIOR

Fig. 3. Disabling illness during a three-months period in the early spring of 1933 in wage-earning families classified according to income per capita in 1932, in Birmingham, Detroit, and Pittsburgh.

for the higher income groups, when illnesses with onset within the survey period are considered. Illnesses with onset prior to the survey period (largely chronic cases) show no relation to income. For illnesses occurring within the survey period, the disabling case rate among the two lower income groups (under $250) is 35 per cent higher and the bed case rate 47 per cent higher than among the group having $425 and over annual per capita income. The poor in 1932 in the surveyed group are obviously subject to more illness than their more fortunate neighbors in relatively comfortable circumstances.

However, it may be argued that a large percentage of the individuals who were poor in 1932 were the chronically poor, the unemployables, so to speak, who were perhaps in a state of poverty *because* of illness and that this group with a very

in large families); (3) possible concentration of sickly individuals in the lower income groups who were the first to feel the effects of the depression because of the handicap of a tendency to sickness.

Preliminary tabulations have been made to investigate these possible sources of error and so far no adjustments found necessary have changed the trends observed in the crude rates. Later papers including more cities will present data on these points.

high illness rate raises the average rate of the poor in 1932. To investigate this point, a further analysis of the illness rate was made from the point of view of changes in family income.

ILLNESS AND INCOME CHANGE

In this analysis the individuals were divided into six categories, according to economic status in 1929 and 1932, as follows:

1. Individuals experiencing lowered family income per capita between 1929 and 1932 were classified as:
   1. Comfortable in 1929 and poor in 1932;

Table 4. Illness and change in economic status, Birmingham, Detroit, and Pittsburgh, 1929–1932.

Depression History[1]		Case Rate per 1,000 Persons for 3 Months Survey Period						Population Observed
		Onset within Period			Onset prior to Period			
1929	1932	Total	Disabling	Bed	Total	Disabling	Bed	
I. INDIVIDUALS WITH DIMINISHED INCOME, 1929–1932								
Comfortable	Poor	189	128	114	88	52	39	1,224
Moderate	Poor	141	100	93	63	40	28	2,847
Comfortable	Moderate	142	92	81	75	42	33	2,683
Total		150	102	92	72	43	32	6,754
II. INDIVIDUALS WITH UNCHANGED INCOME, 1929–1932								
Comfortable	Comfortable	130	80	66	87	47	33	1,431
Moderate	Moderate	136	97	88	56	34	27	1,905
Poor	Poor	134	81	75	91	45	35	1,037
Total		133	87	78	75	41	31	4,373

[1]Comfortable — $425 and over per capita per year.
Moderate — $150–$424 per capita per year.
Poor — Under $150 per capita per year.

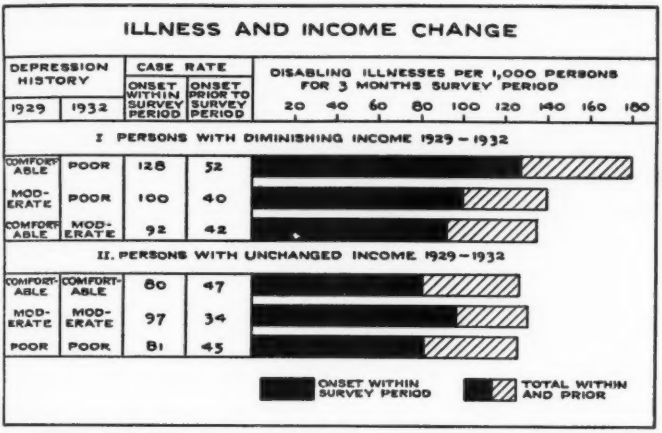

ILLNESS AND INCOME CHANGE
DEPRESSION HISTORY
1929
1932
CASE RATE
ONSET WITHIN SURVEY PERIOD
ONSET PRIOR TO SURVEY PERIOD
DISABLING ILLNESSES PER 1,000 PERSONS FOR 3 MONTHS SURVEY PERIOD
20 40 60 80 100 120 140 160 180
I PERSONS WITH DIMINISHING INCOME 1929 – 1932
COMFORTABLE POOR 128 52
MODERATE POOR 100 40
COMFORTABLE MODERATE 92 42
II. PERSONS WITH UNCHANGED INCOME 1929 – 1932
COMFORTABLE COMFORTABLE 80 47
MODERATE MODERATE 97 34
POOR POOR 81 45
ONSET WITHIN SURVEY PERIOD
TOTAL WITHIN AND PRIOR

Fig. 4. Disabling illness during a three-months period in the early spring of 1933 in wage-earning families classified according to change in per capita income, in Birmingham, Detroit, and Pittsburgh, 1929-1932.

Comfortable—$425 and over per capita per year.
Moderate—$150-424 per capita per year.
Poor—Under $150 per capita per year.

2. Moderate in 1929 and poor in 1932;
3. Comfortable in 1929 and moderate in 1932.

II. Individuals who had not experienced lowered family income between 1929 and 1932 were classified as:
1. Comfortable in 1929 and 1932;
2. Moderate in 1929 and 1932;
3. Poor in 1929 and 1932.

The results are given in Table 4 and Figure 4. Here we see a significant difference between the disabling illness rate of Group I and Group II, 102 as compared with 87, and the interesting fact appears that persons who suffered lowered income had a higher sickness rate than those whose economic status did not change greatly. In fact, the highest illness rate in Group I was experienced by individuals whose fortunes had suffered the greatest change, namely, the group classified as comfortable in 1929 but poor in 1932. This group, with a

rate of 128 per 1,000, showed an incidence of disabling illness 60 per cent higher than the rate (80) of their more fortunate neighbors who were equal in status in 1929 but suffered no drop in income by 1932, that is, the "comfortable in 1929 and 1932" group. The group which dropped from comfortable to moderate showed a 15 per cent higher disabling illness rate than the comfortable group which experienced no drop in income. The group which dropped from moderate to poor shows about the same illness rate as the group which had been in moderate circumstances throughout the four years.

The same trends are observed for the total illnesses which had their onset within the survey period, and even the addition of the cases with onset prior to the survey period (largely chronic) does not obscure the fact that a relatively severe drop in economic status appears to be associated with a high illness rate.

ILLNESS AND UNEMPLOYMENT

In Table 5 and Figure 5 is shown the relation between unem-

Table 5. Illness and unemployment, Birmingham, Detroit, and Pittsburgh.

Employed Workers in the Family	Case Rate per 1,000 Persons for 3 Months Survey Period						Population Observed
	Onset within period			Onset prior to period			
	Total	Disabling	Bed	Total	Disabling	Bed	
No employed workers	160	122	114	91	55	40	1,402
Part-time workers (1 or more; no full-time)	157	98	89	70	40	30	4,561
Full-time workers (1 or more; 0 or more part-time)	127	88	77	72	42	32	5,367

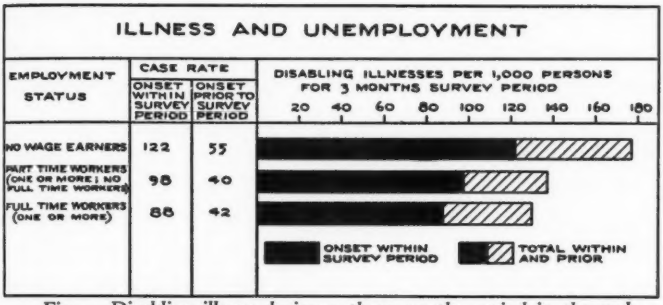

ILLNESS AND UNEMPLOYMENT
EMPLOYMENT STATUS
CASE RATE
ONSET WITHIN SURVEY PERIOD
ONSET PRIOR TO SURVEY PERIOD
DISABLING ILLNESSES PER 1,000 PERSONS FOR 3 MONTHS SURVEY PERIOD
20 40 60 80 100 120 140 160 180
NO WAGE EARNERS 122 55
PART TIME WORKERS (ONE OR MORE) NO FULL TIME WORKERS 98 40
FULL TIME WORKERS (ONE OR MORE) 88 42
ONSET WITHIN SURVEY PERIOD
TOTAL WITHIN AND PRIOR

Fig. 5. Disabling illness during a three-months period in the early spring of 1933 in families classified according to the employment of wage-earning members, in Birmingham, Detroit, and Pittsburgh.

ployment and the illness rate. For this purpose the surveyed population was divided into three groups of individuals from families having (1) no employed workers; (2) one or more part-time workers but no full-time workers; (3) one or more full-time workers with or without additional part-time workers. As might be expected from the relation between illness in 1933 and 1932 income, the illness rate is highest in the families having no employed workers (122 disabling cases per 1,000) and lowest in households having full-time workers (88 per 1,000). The group with no employed workers has a higher illness rate than the group with annual per capita income under $150 (Table 3)—122 as against 103 disabling cases per 1,000 persons.

SUMMARY

Records of illness in 1933 and of economic history from 1929 to 1932 have been collected on over 12,000 families in eight large cities, one group of coal-mining communities, and a group of cotton-mill villages. The present paper presents preliminary results of the survey in three cities—Birmingham, Detroit, and Pittsburgh. This group comprised 2,566 families including 11,330 individuals.

The results show a higher incidence of disabling illness

among individuals in the lower income classes than among individuals with higher incomes. The highest illness rate is reported by a group which was in reasonably comfortable circumstances in 1929 but which had dropped to comparative poverty by 1932; the rate of this group is 60 per cent higher than that of their more fortunate neighbors who were equal in economic status in 1929 but suffered no drop in income by 1932. The group of individuals who may be described as "chronically poor," that is, individuals who were in a condition of poverty even in 1929, showed a relatively low sickness rate as compared with the group which had fallen into straitened circumstances as a result of the economic depression. The rate of disabling illness reported among individuals from families of the unemployed was 39 per cent higher than that of the group having full-time wage-earners and 25 per cent higher than that of the group containing part-time but no full-time workers.

The foregoing findings are generally true for the surveyed group in each of the cities as well as for the total of the three cities.

As regards the significance of the findings, the writers have purposely refrained from drawing conclusions as to their broad implications and the reader is cautioned to exercise similar restraint. For example, how large a proportion of the entire wage-earning population in urban areas in the United States has suffered increased illness obviously cannot be estimated from the experience recorded in the samples surveyed in three cities only. Nor is it possible to suggest any specific interpretations of increased illness rates in terms of impaired vitality until the nature of the sickness experienced is considered. Conclusions and interpretations of this kind should await more complete analysis of the entire volume of data collected.

NUTRITION AND THE DEPRESSION

FINDINGS OF A MEDICAL EXAMINATION OF A GROUP OF NEW YORK SCHOOL CHILDREN IN RELATION TO FAMILY INCOMES[1]

by CLYDE V. KISER AND REGINE K. STIX, M.D.

THE study by the United States Public Health Service and the Milbank Memorial Fund of the health of population groups which have been seriously affected by the depression included the physical examination of approximately one thousand school children from families on which economic and sickness data had been obtained. The examinations were conducted in order to supplement the sickness data in ascertaining whether or not changed economic conditions are related in any way to the nutrition and health of the school child. This paper is a preliminary report on the information relating to nutrition which was collected in the course of the examinations in New York City.

THE CHILDREN EXAMINED

Five hundred and fourteen children were examined in New York. They lived in the Bellevue district of Manhattan which includes the northern end of the well-known "lower East Side." According to the 1930 Census, about one-eighth of the 4,296 heads of families in this area were native white of native parentage and one-fifth native white of mixed parents. About one-third of the foreign-born heads of families were of Italian birth and the remainder came mainly from

[1]From the Division of Research, Milbank Memorial Fund, in cooperation with the United States Public Health Service. Acknowledgments are gratefully made to Dr. Shirley W. Wynne, Commissioner, New York City Department of Health, and Dr. I. Cohen of the Bureau of Child Hygiene, who arranged for the examinations. Additional thanks are due Drs. Harry Sherwood and Maurice Gelb who were loaned by the Bureau of Child Hygiene to assist Dr. Stix in examining the children. The examinations were made according to a plan drawn up by Dr. Estella Ford Warner, Surgeon, United States Public Health Service.

countries in central and southern Europe. The race stock of almost one-half of the children in the sample was Italian[2]. The racial composition of the sample is quite similar to that of the entire population of the area.

Economically the area is a poor one. In 1930 the median rental in the district was $20.33[3] as compared with $43.64 in all Manhattan and $46.45 in Greater New York. Less than one per cent of the families in the district paid as much as $50 rent per month as compared with more than 40 per cent of families in Manhattan and in Greater New York.

The physicians examining the children knew nothing of the economic background of any child examined. The data relating to income were collected independently in the general sickness survey and were correlated with the results of the physical examinations after the completion of both aspects of the study.

Incomes of the families represent not only wages but pensions, grants from relief organizations, borrowed funds and savings used for basic living expenses, and value of free rent given in return for services as janitor. It was clearly evident that the gross as well as the per capita[4] incomes of the families whose children were examined were generally low. Nearly 60 per cent of the children, representing about half the total number of families, came from families in which the per capita income was less than $4.00 per week in 1933. Only about one-fourth of the families represented had per capita incomes of $6.00 a week or more.

[2]Families considered as Italian were generally those in which both husband and wife were Italian born or native born of Italian parentage. Very few cases of mixed race stock were found.

[3]That is, half of the families paid more than this rent and half less.

[4]See a preceding paper in this issue of the *Quarterly Bulletin* by G. St.J. Perrott and Selwyn D. Collins (Sickness and the Depression) for a description of the method of collecting income data and of computing family income per capita.

About one-third of the families (represented by about 40 per cent of the children examined) were receiving relief from organized agencies at the time of the enumerator's visit or during an extended period immediately preceding it. These families divide themselves into two categories because of differences in the two major types of relief represented. Those aided by the Home Relief Bureau received their allowance in the form of food tickets distributed on the basis of size and age-sex constituency of each household. Except in families in which one or more members of the household were wage-earners, this income was below $2.00 per week per person and was of necessity spent entirely or almost entirely for food. In all other types of organized relief, money could be spent for items other than food. While on the whole, per capita incomes in this group were larger than those in the home relief group, the amount of money available for food was comparable or smaller.

PREVALENCE OF MALNUTRITION

The physician's estimate of nutrition, made immediately after completion of the physical examination, and here used as the measure of nutrition, was based on an appraisal of the child's general physical condition, with special emphasis on amount of subcutaneous fat present, texture of skin and hair, quality of muscle tone, and evidence of old rickets.

More than one-third of the 514 children examined were rated "poor" or "very poor" by the examining physicians, while only about one-fourth were rated "good" (Table 1). Any comparison of this finding with predepression nutrition ratings must be made with caution because of wide variation in nutrition standards. In 1923, Clark, Sydenstricker, and Collins reported on the results of careful physical examinations made by United States Public Health Service physi-

cians on a group of nearly 10,000 school children from various small towns and villages.[5] A four-fold rating of nutrition similar to ours was used by these physicians. Of these 10,000 children, 83.3 per cent were rated "excellent" or "good" and 16.7 per cent "fair" or "poor." By combining the classes in Table 1 we may obtain a slightly different two-fold rating, as follows: "good" or "fair", 65.2 per cent; "poor" or "very poor", 34.8 per cent. The age groups in the two studies are parallel, but Clark, Sydenstricker, and Collins studied children representing cross-sections of entire communities and the nutrition ratings of these children, even in 1923, may have been higher than those of children taken exclusively from a city slum. Taking all differences into consideration, however, our sample appears to contain a relatively high percentage of malnourished children.[6]

Table 1. Nutrition ratings for a group of New York City school children from low income families, 1933.

Nutrition Rating	Number	Per Cent
Total	514	100.0
Good	126	24.5
Fair	209	40.7
Poor	150	29.2
Very poor	29	5.6

[5]Clark, T., Sydenstricker, E., and Collins, S.D.: Weight and Height as Index of Nutrition. Washington, United States Public Health Service *Public Health Reports*, Reprint No. 809, 1924.

[6]The nutritional status of boys in this group appeared to be lower than that of girls as the following table shows:

Nutrition Rating	Males		Females	
	Number	Per Cent	Number	Per Cent
Total	252	100.0	262	100.0
Good	41	16.3	85	32.4
Fair	110	43.7	99	37.8
Poor	79	31.3	71	27.1
Very Poor	22	8.7	7	2.7

This result appeared for each of the age groups 6–9, 10–11, and 12 or more years

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Weekly Family Income per Capita	Number of Children with Specified Nutrition Rating					Per Cent with Specified Rating	
	Total	Good	Fair	Poor	Very Poor	Good	Poor and Very Poor
Under $4.00	301	56	122	104	19	18.6	40.9
$4.00–$5.99	126	37	54	30	5	29.5	27.8
$6.00 and over	87	33	33	16	5	37.9	24.1

Table 2. Nutrition ratings for a group of New York City school children classified according to family income in 1933.

NUTRITION AND FAMILY INCOME

An analysis of our sample according to family income gives us more direct evidence on the nutrition of children in families seriously affected by the depression. Practically all of the families in the highest income range were found to have been in the highest income range since 1929. They can therefore be presumed to represent, in a general way, the normal (or non-depression) expectation of malnutrition in a low-income city group.

A consistent direct association between nutritional status and family income was found (Table 2). More than 40 per cent of the children in the lowest income class (under $4.00 per capita per week) were rated "poor" or "very poor" in nutrition while less than 25 per cent of the children in the highest income class ($6.00 and over per capita per week) were so rated. Conversely, only 19 per cent of children from families in the lowest income class were rated as "good" in nutrition as against 38 per cent in the highest income class.

and persists in each of the comparisons from the point of view of economic status made later in this paper. We are unable to account for this sex difference at the present time.

The distributions according to sex and age in all of the groupings employed in this report were similar and from this point of view the groups may be regarded as comparable.

Weekly Family Income per Capita	Number of Children with Specified Nutrition Rating					Per Cent with Specified Rating	
	Total	Good	Fair	Poor	Very Poor	Good	Poor and Very Poor
Less than $4.00 in both years	247	41	102	88	16	16.6	42.1
$4.00 or more in 1932 but less than $4.00 in 1933	54	15	20	16	3	27.8	35.2
Less than $4.00 in 1932 but $4.00 or more in 1933	37	9	19	8	1	24.3	24.3
$4.00 or more in both years	176	61	68	38	9	34.7	26.7

Table 3. Nutrition ratings for a group of New York City school children classified according to family incomes in 1932 and 1933.

The family incomes during 1932 have also been computed and it is possible to classify the families according to change in income between 1932 and 1933[7]. Since the small number of children examined precludes many classifications the following were made:

1. Less than $4.00 in both years—the poorest class;
2. $4.00 or more in 1932 but less than $4.00 in 1933, a group which suffered a drop in income;
3. Less than $4.00 in 1932 but more than $4.00 in 1933, a group whose income increased somewhat;
4. More than $4.00 in both years, presumably a class affected by poverty to a less extent than any of the other three.

As may be expected, the proportion with "poor" or worse nutrition was highest for children with weekly family incomes of less than $4.00 per capita in both years and much lower for those with $4.00 or more in both years (Table 3).

[7]The average weekly income for 1932 was computed on a basis slightly different from that for 1933. The income data obtained for 1932 covered the year as a whole whereas that for 1933 related to a single week, the week preceding the visit to the household.

On the other hand, a lowering of nutritional status appears to be associated with a drop in family income since the proportion of malnourished ("poor" and "very poor") children in families whose income was $4.00 or more in 1932 but under $4.00 in 1933 was greater than that in families whose incomes were $4.00 or more in both years or rose to that level in 1933. As has been pointed out, the number of children examined is small, but the results are consistent in themselves and with the logic of the situation.

Since information was obtained as to the type of relief received in 1933, it is possible to make a comparison of the nutritional status of children from families receiving the two major types of relief, already referred to, and from families receiving no relief but classified according to income (Table 4). Here the most significant difference not heretofore demonstrated is in the comparison of the ratings of children from the home-relief group with those from families receiving comparable incomes either from other organized relief agencies or from sources other than relief. The highest ratings were given children from the home-relief group of whom nearly 23 per cent were rated "good" as compared with

Table 4. Nutrition ratings for a group of New York City school children classified according to type of family relief and income.

Type of Relief and Weekly Family Income per Capita in 1933	Number of Children with Specified Nutrition Rating					Per Cent with Specified Rating	
	Total	Good	Fair	Poor	Very Poor	Good	Poor and Very Poor
Work relief and miscellaneous	60	5	31	19	5	8.3	40.4
Home relief	145	33	58	44	10	22.8	37.2
Non-relief under $4.00	111	21	44	42	4	18.9	41.4
Non-relief $4.00–$5.99	111	34	43	29	5	30.6	30.6
Non-relief $6.00 and over	87	33	33	16	5	37.9	24.1

19 per cent from the poorest non-relief group, and about 8 per cent from the group receiving aid from social agencies other than the Home Relief Bureau.

Two-thirds of the children in the home-relief group came from families whose per capita weekly income was less than $2.00; of the group classified as "Work Relief and Miscellaneous" only one-fourth came from homes in which the income was this low, while about one-fourteenth of the children from the comparable group receiving no relief came from homes in which the income was less than $2.00 per person per week. The higher nutrition rating of children from the home-relief group in spite of these marked differences in distribution of income is of especial interest in view of the fact that food tickets issued to home-relief families have no cash value for anything except food, while families in the other two groups are free to spend portions of their income for items other than food. The diet survey indicates that families in the latter groups received a less adequate diet than did the families in the home-relief group[8].

When the nutrition ratings of Italian children were compared with those of the remainder of the group, no significant differences were found.

SUMMARY

Without attempting to discuss their implications at this time, the indications afforded by the examinations of 514 New York school children in a poor area in 1933 as related to family income and relief may be summarized briefly:

1. Within this group of children there is a direct association between nutrition and income. Forty per cent of children from the lowest income groups were rated "poor" or "very poor," while only 25 per cent of the children from the higher income groups were so rated.

[8]Wiehl, Dorothy G.: Diets of Low-Income Families in New York City, p. 308.

2. A lowering of nutritional status appears to be associated with drop in family income in as short a time as a year.

3. In the lowest income group, children from families receiving aid from the Home Relief Bureau had somewhat higher nutrition ratings than those from families receiving other types of relief or having comparable incomes from sources other than relief. This is of especial interest in view of the fact that, although the per capita weekly income of families receiving home relief was lower than that in either of the other categories, the cash income given had to be spent for food.

4. The proportion of children suffering from malnutrition in the group examined appears to be considerably larger than the proportion of malnourished children we should expect to find in a non-depression era. While we have no records for other groups of children which are directly comparable with our data, the difference in the prevalence of malnutrition among children of low-income families as compared with that among children from the highest income families, in which there has been relatively little change in income since 1929, is definitely shown for the group included in this study.

DIETS OF LOW-INCOME FAMILIES IN NEW YORK CITY[1]

by DOROTHY G. WIEHL

THE importance of adequate food for families suffering severe economic strain in ameliorating the potential effects of poverty on health is well recognized, and charitable and relief agencies have concentrated on aiding families to maintain minimum food standards during the present emergency which has so seriously reduced standards of living. Nutritionists have been called upon to recommend minimum cost diets which would provide marginal food requirements and an effort has been made to teach the relief families how to buy and what to buy in order to make the very limited relief funds provide a diet yielding the necessary calories, vitamins, and mineral elements. Many families not on relief have an equal necessity to economize on food, even though they reduce their standard of living in other respects and spend a larger and larger proportion of their funds on food. They have not had the same advice on planning their food budgets that is given to relief families and of course do not have the restrictions on choice of food which has frequently been imposed on the relief families. Any consideration of the health of the population seriously affected by the current depression should include a study of the evidence of serious under-nutrition or food deficiency.

This report on the dietary of groups of low-income non-relief families and relief families in a poor district of New York City is one of a series giving the results of the study of the health of wage-earning families made by the United States Public Health Service and the Milbank Memorial Fund. It presents a preliminary analysis of the food con-

[1]From the Division of Research, Milbank Memorial Fund.

sumption of 277 families during one week. These families are about one-fourth of the total families included in the sickness survey in New York City.

During April, 1933, enumerators visited about 1,200 families to obtain sickness and income data. The families were selected at random from an East Side area in the Bellevue district of Manhattan which the 1930 Census had shown to be an area of low rents. It is a white district with few Jewish families. In about two-thirds of the families, the head was foreign born; in 20 per cent, the head was native born of foreign or mixed parentage; and in 12 per cent, native born of native parentage. About one-half of the foreign born were Italians and a similar proportion of the native born of foreign-born parents were of Italian parentage. No other nationality was represented to any predominant extent.

After the families in the sickness survey were classified according to income in 1932, an approximately equal number of families were drawn at random from each broad income class for which diet records were to be obtained. The collection of diet records began the last of April and was not completed until late in June. The investigator went over with the housewife a list of all the basic foods and lists of vegetables and fruits and entered the amount consumed by the family in the week preceding the date of visit. With careful questioning as to whether the family did or did not have a particular food in the preceding week and, if so, how much, it is believed that a reasonably accurate record is obtained of the family food supply for the week. Questions were asked also as to which members of the household drank milk and ate oranges, the number of meals eaten away from home by any of the family, and whether this week was typical of the family's diet.

A record of the foods consumed by a family during one week obviously cannot give a complete cross-section of that

family's diet. It does give some indication of the amount of food being consumed and of the family's dietary habits with respect to the major food groups, such as their consumption of cereal foods, sweets, fats, vegetables and fruits, and meats. In the case of milk, the supply probably varies only slightly, but the kinds of vegetables and fruits eaten may be very different from week to week, especially with changing seasons. The average consumption of various foods for groups of families of similar economic status probably represents the typical dietary of the majority of the families in the group more closely than an individual family's food consumption for a single week typifies its average diet.

ECONOMIC CLASSIFICATION

On the basis of the family income for the week for which the diet schedule was taken, the families have been grouped into six economic classes, two classes of families on relief and four of those not on relief.

For the families not receiving relief, the income per capita for the week was computed using that week's wages. When families earned rent by doing janitor service, the value of the rent was prorated for a week and added to the income. While the earnings, in some instances, may vary considerably from week to week, most wage-earners apparently were earning about the same amount each week though many were employed only part time. Furthermore, in low-income families, the immediate or present earnings probably influence the food supply more than an average income over a longer period of time. When no one was working, the family was classified on the basis of the funds borrowed or used from savings; such families mostly fall in the lowest economic group. The classification used is: (1) families with less than $3.00 per capita per week, or the nearly destitute and "very poor;" (2) those

with $3.00 to $3.99 per week, or "poor;" (3) those with $4.00 to $5.99 per week, or "moderately poor;" (4) those with $6.00 or more per capita per week, or "relatively comfortable."

The two groups of families on relief are those receiving "home relief" or food orders and those on work relief. All families receiving food orders regularly were put in the home-relief group, even though they earned some money at odd jobs, or someone was working regularly but, because of the size of the family, it was evidently dependent on this aid. But families who received an occasional Red Cross food box or Salvation Army box were not classed as "home-relief" families if they had a steady source of income. A very few families dependent on aid from charitable organizations other than the City Home Relief Bureau were put in the "home-relief" group. All of these families received regularly aid to an amount calculated to provide specifically for the food needs of the family, and may from time to time have had additional aid in the form of rent, gas or electricity payments, and clothes. Most of the families on work relief received $45.00 per month, and correspond to the lowest income group of families not on relief.

METHOD OF ESTIMATING THE FOOD REQUIREMENTS

The amount of food needed by a family or by any group of individuals varies according to the age and sex composition of the group. The usual method of measuring the needs of different persons is to express the food requirements of each person in terms of or as a fractional part of the food required by an adult male. The scale of relative allowances of calories for persons of each sex and different ages used by the United States Bureau of Home Economics has been followed in this study.[2] The calories needed by an adult man at moderate

[2]The scale for relative allowances of calories for individuals by sex, age and

(continued on page 312)

muscular work are taken as a standard and equal 100 and the relative need of persons of each other age and sex is given as a percentage of this standard. By summating the percentages required by each member of the family, the number of equivalent adult males is obtained. This number multiplied by the calories in the standard for an adult male (3,000 per day) gives the total calories needed by a family; or, the total calories in a given food supply divided by the number of equivalent adult males indicates the average caloric value per adult male. The same relative allowances are used for protein and vitamin requirements but the relative allowances for mineral elements in the diet, such as calcium, phosphorus, and iron are different.

In the calculation of equivalent adult male units in the families in this study, 100 was used for all men from 18 to 59 years of age and 90 for all women, since the amount of muscular activity was unknown. For men who were unemployed throughout the week, this allowance is a little high but it did not seem practicable to attempt to make an adjust-

activity as percentages of the standard for an adult man at moderate muscular work furnished by the Bureau of Home Economics is as follows:

Age and Activity	Relative Allowance—Per Cent	
	Men	Women
Under 2 years	30	30
2– 3	40	40
4– 5	50	50
6– 7	60	60
8	70	70
9–10	80	70
11–12	90	80
13	90	90
14	100	90
15	100	80
16–17	110–130	80
18–59—sedentary	80	70
18–59—light	90	80
18–59—moderate	100	90
60 and over—moderate	90	80
60 and over—sedentary	80	70

ment for the amount of activity. If we assumed that the relative allowance for the unemployed male was 80 (allowance for sedentary males and probably low even for unemployed persons) instead of 100, this would reduce the requirement for most families less than 5 per cent since the average adult male units per family was 4.38. In the case of men and women 60 years of age or over the relative allowance used was 90 and 80 respectively for those employed and 80 and 70 respectively for those at home. Also for boys 16 or 17 years of age a difference was made on the basis of whether the boy was employed or not; boys at work were given an allowance of 120 and those in school or at home 110.

An adjustment in the estimate of the weekly food supply needed by a family was made for meals taken outside the home by deducting a proportionate amount from the equivalent adult male unit or percentage on the basis of the number of meals. Thus, if a man bought his lunch five days a week but ate the remaining meals during the week at home, his equivalent adult male unit was reduced to 16 twenty-firsts of 100 or 76. Similar proportionate reductions were made for children furnished lunch by the school and for adults receiving meals in connection with their occupation.

AVERAGE CALORIES IN DIETS OF DIFFERENT INCOME GROUPS

There is general agreement that a daily food supply furnishing at least 3,000 calories or heat units is needed by the average man employed at moderate work for eight hours a day and surveys of the actual diets of various groups indicate that a diet yielding something more than 3,000 calories is normal under favorable conditions.[8] The average calories

[8]The study of the food consumption for one year of 100 families of employees of the Ford Motor Company in 1929 showed that their diet yielded an average of 3,236 calories per day per equivalent male unit. These families had been

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Income Group	Number of Families	Number of Equivalent Male Units	Calories per Day per Male Unit
Home-relief families	56	246.4	2,665
Work-relief families	27	131.3	2,361
Income per capita per week:			
Under $3.00	38	200.7	2,327
$3.00 to $3.99	35	172.9	2,359
$4.00 to $5.99	64	266.1	2,897
$6.00 or more	57	194.7	3,356

Table 1. Average calories per day per equivalent male unit in a week's food supply of families of different economic status in a low-income district in New York City.

per day per male unit in the diets of the families in the six different income groups are shown in Table 1.

The calories in the food supply have been calculated by applying average calorific values to pounds of foods of the various general types shown in Table 2. The amount of each food consumed was reported in pounds only when that is the usual unit of purchase. For foods reported according to various other units, the amounts were converted into pounds and the accuracy of the weight must vary considerably for individual families. In the case of canned and packaged foods, the price, which was usually given, indicated the size, and the net weight could be computed with a high degree of accuracy. But in the case of fresh vegetables and fruits reported in such units as a bunch of carrots, a head of cabbage, a dozen oranges, et cetera, average weights had to be applied. Usually the price paid was stated and with the aid of price lists from several neighborhood stores, it is believed that fairly accurate estimates were possible in most instances.

selected so that their annual incomes were similar and the average for the group was $1,711. See: Standard of Living of Employees of Ford Motor Company in Detroit. *Monthly Labor Review* (June, 1930) of the Bureau of Labor Statistics, United States Department of Labor.

Furthermore, inaccuracies for individual families should tend to balance and reduce the error in the average values.

Only families with an income of $6.00 or more per person per week reported a food supply fully adequate for standard energy requirements. The average of 3,356 calories per male unit for this income group is very close to the higher energy value recommended by several authorities. It is also very near to the average of 3,236 calories reported for the employees of the Ford Company in Detroit, a group for which the average per capita income per week was $7.30. The families with $4.00 to $6.00 per person per week reported a food supply slightly below standard for energy value (2,897 calories per male unit) but this should prevent under-nutrition if foods are well chosen to give a balanced diet.

The average fuel value of the food supply for families having less than $4.00 per person per week was approximately 20 per cent below the minimum standard. Families on work relief reported a diet yielding the same number of calories per male unit as other low-income families. This is consistent with their income inasmuch as practically all of these families had less than $4.00 per person per week.

Home-relief families reported a more adequate amount of food than either the work-relief families or the families with less than $4.00 per person per week, although the calories per male unit averaged about 10 per cent less than the standard of 3,000 calories. The monetary value of food tickets issued to home-relief families is determined by nutrition experts to provide adequate cheap food to prevent serious under-nutrition if a proper choice of foods is made. The fuel value of the diet reported by these home-relief families is marginal and while it should maintain most persons without loss of weight, it would not build up the body or overcome past effects of a deficient food supply.

KINDS OF FOODS PURCHASED BY FAMILIES OF DIFFERENT INCOMES

A balanced diet must contain some of each of the five general groups of foods; namely, (1) milk, meat, and other protein foods, (2) fats, (3) cereals, (4) sugars, and (5) vegetables and fruits. Many studies have determined the approximate amount of each group needed to provide all the substances needed to make a diet wholesome unless some special condition exists, such as an extremely restricted choice in one or more groups; or the complete lack of certain foods essential to provide some protective element such as a specific vitamin. Therefore, it is possible to evaluate the quality as well as the quantity of the food supply of the families in these different income groups by comparing their consumption of the various kinds of foods with a standard dietary. There is, however, no one standard for a balanced diet but many, since most substances required by the human body are found in a wide variety of foods and many substitutes are possible. For example, it is estimated that the average adult requires about one gram of protein per day per kilogram of body weight,[4] but this may be derived chiefly from meats or flesh foods, or from other foods, such as cheese, beans, peas, and nuts, which contain efficient proteins. Therefore, when the diet of a group is compared with a standard, allowance must be made for the substitution of foods and such substitutions must be evaluated for their efficiency in providing specific elements.

In Table 2, the average consumption of each general group of foods and of several classes of foods within the groups is given and compared with recommended amounts. Two stand-

[4]Sherman, Henry C.: Chemistry of Food and Nutrition. New York, The Macmillan Company, 1932, p. 511.

ards are shown, one for adequate diets at low cost[5] and the other for a balanced diet at moderate cost.[6]

Table 2. Average weekly consumption of various foods per adult male reported by families on relief and by non-relief low-income families in New York City, 1933.

Type of Food	Pounds per Week per Male Unit for Specified Economic Group							
	Standard Low Income[1]	Home Relief	Work Relief	Weekly Income per Capita				Standard Moderate Income[2]
				Less than $3.00	$3.00–$3.99	$4.00–$5.99	$6.00 or more	
Protein Foods								
Milk—qts.	4.5 – 5.2	3.83	3.48	3.62	4.31	4.94	4.68	3.5 – 5.0
Total meat, fish, eggs, cheese	1.5 – 2.0	1.87	2.49	2.13	2.53	3.35	4.39	3.5 – 4.5
Meat (exc. pork)		.63	1.27	.73	1.02	1.51	1.86	
Pork (exc. sausage and bacon)	1.0 – 1.5	.15	.29	.14	.25	.31	.49	3.0 – 4.0
Fowl		.02	.10	.22	.23	.37	.67	
Fish		.29	.24	.34	.40	.44	.42	
Eggs	.2 – .3	.61	.48	.59	.53	.61	.80	.4
Cheese	.25	.17	.10	.11	.10	.11	.15	.25
Fats and Fat Foods—Total	.8 – 1.0	.90	.79	.83	.77	.94	1.05	1.0 – 1.5
Lard and substitutes	.3	.09	.09	.11	.09	.10	.09	.3
Olive oil		.35	.21	.25	.18	.21	.20	
Bacon and pork sausage	.3	.10	.17	.10	.09	.08	.12	.2 – .3
Butter	.3	.35	.31	.34	.36	.47	.55	.5
Cream		0	.01	.03	.05	.08	.09	.2 – .3
Cereal Foods—Total	5.0 – 6.0	5.71	4.48	4.26	4.43	5.09	5.82	3.3 – 4.3
Flour and cereals		1.83	1.32	1.32	1.14	1.33	1.55	1.3
Bread		3.79	3.08	2.80	3.11	3.57	3.96	2.6
Cakes and pie		.09	.08	.14	.18	.19	.31	
Sugary Foods—Total	.8 – 1.3	.96	.88	1.06	.94	1.06	1.34	1.2 – 1.5
Sugar and candy	.3 – .6	.81	.74	.97	.75	.90	1.11	.8 – 1.0
Syrup and honey	.6	.05	.02	.02	.05	.03	.06	.4
Jelly and preserves		.07	.10	.06	.13	.12	.15	.1
Cocoa		.03	.02	.01	.01	*	.02	
Vegetables and Fruits—Total	8.8 – 10.0	8.24	7.69	7.72	7.18	11.38	13.95	13.0 – 18.0
Potatoes	3.5	2.87	2.64	2.50	1.98	3.01	3.06	3.7
Tomatoes, canned-fresh	1.5	.75	.72	.76	.71	.91	.99	.3
Green leafy vegetables	1.0 – 1.3	1.04	1.09	.91	.75	1.20	1.59	5.0 – 8.0
Other veg. canned-fresh	1.5 – 1.8	1.83	1.35	1.44	1.28	2.24	3.07	
Dried vegetables	.3 – .6	.09	.09	.02	.01	.01	.01	.4
Fruits—canned or fresh	1.0	1.39	1.58	1.92	2.32	3.81	4.97	4.5 – 5.5
Fruits—dried	.3	.27	.22	.17	13	.20	.26	.2

[1]Derived from data in Miscellaneous Publication No. 113, of the United States Department of Agriculture, April, 1931. Hazel K. Stiebeling and Miriam Birdseye: Adequate Diets for Families with Limited Incomes.

[2]Derived from data in Farmers' Bulletin No. 1313, United States Department of Agriculture, May, 1928. Caroline L. Hunt: Good Proportions in the Diet.

*Less than .005.

[5]Derived from data in Miscellaneous Publication No. 113, of the United States Department of Agriculture, April, 1931. Hazel K. Stiebeling and Miriam Birdseye: Adequate Diets for Families with Limited Incomes.

[6]Derived from data in Farmers' Bulletin No. 1313, United States Department of Agriculture, May, 1928. Caroline L. Hunt: Good Proportions in the Diet.

Some of the more outstanding indications in Table 2 may be summarized here.

1. For families in the highest income class the average consumption of foods in each of the general groups closely approximates the standard for persons of moderate income. Each group of foods is adequately represented in the diet. The amount of bread is rather high which could account for the high caloric value of the dietary of this group noted above. The use of milk and meat is liberal and the different types of vegetables and fruits are well represented.

2. In the diet of the medium-income class, the average consumption of each group of foods except milk was slightly less than in that of the highest income class, but all groups of foods were well represented. The use of vegetables and fruits was less than the recommended amount for moderate-income diets but more than the allowance for a restricted low-income diet.

3. The two low-income classes and the work-relief families had very similar diets as well as approximately equal numbers of calories. Their use of vegetables and fruits, of cereal foods, and of milk was lower than the quantities recommended for a low-income diet and their use of meat and eggs was somewhat higher than the recommended amounts, though less than that of higher income families.

4. For the home-relief families, the average amounts of different groups of foods corresponds closely to the recommended amounts in the low-income standard except that the milk consumption is a little low. These families receive advice on how to spend the value of their food ticket and are restricted in the amount of meat.

5. The average consumption of tomatoes for all income classes was fairly high, though less than the low-income dietary calls for.

6. The consumption of green leafy vegetables for all income classes was close to the low-income standard. The season was favorable to the use of leafy vegetables: spinach, dandelion greens, and new cabbages were cheap and plentiful. The cheapness of many fresh vegetables in May and June also would account for the very low consumption of dried vegetables.

Table 3. Proportion of total calories derived from various groups of foods in the reported diets of New York City families in different income classes compared with proportions in a well planned diet and in the average American dietary.

Income Class	Calories Derived from					
	Cereals	Milk and Cheese	Lean Meat, Fish, Eggs	Vegetables and Fruit	Fats	Sugars
Minimum cost diet, adequate for 2 moderately active adults and 3 children[1]	32	24	8	14	15	7
Average American dietary[2]	38	8	21	12	10	10
Home-relief families	41	14	7	12	17	9
Work-relief families	36	14	13	12	16	9
Non-relief—per capita income per week:						
Less than $3.00	35	15	10	12	17	11
$3.00–$3.99	35	17	12	10	16	10
$4.00–$5.99	33	16	14	13	15	9
$6.00 or more	33	13	16	14	14	10

[1]From a table furnished by The Bureau of Home Economics, U. S. Department of Agriculture, to be published soon in Circular No. 296, by Hazel K. Stiebeling and Medora M. Ward. In higher cost diets, the percentage of calories from meats, vegetables and fruits increases and that from cereal foods correspondingly decreases; the percentage from fats and sugars remains about constant.

Since all families in our study had at least one child and the average persons per family was 5.3, the standard distribution for a 5 person family with 3 children is used for comparison.

[2]Sherman, Henry C.: Chemistry of Food and Nutrition. New York, The Macmillan Company, 1932, p. 523.

PROPORTION OF CALORIES FROM VARIOUS FOODS

In planning diets at various costs that would provide the nutritional needs of families of different composition, the nutritionists have developed tables which give the percentage of total calories in the diet to be derived from each group of foods. When bodily needs for various foods and protective substances are taken into consideration, as well as relative costs of different foods, these proportions represent the desirable distribution of foods in the diet. It is of interest to compare the proportionate use of different food groups by these New York City families with the proportions in a balanced diet planned for the use of low-income families and with the average American dietary as indicated by 224 studies. It is apparent from Table 3 that in a balanced minimum cost diet, cereals and milk and cheese are predominant and that the average American diet is built more on cereals and meat.

The New York families, especially those with less than $4.00 per person per week, derived too small a proportion of their calories from milk and milk products and vegetables and fruits, and too great a proportion from lean meat, fish and eggs, and sugars, according to the nutritionists' standards for a balanced low-income diet. The food budget of the families on a more liberal diet had a better representation of milk and vegetables and fruits than the average American diet.

DIET OF ITALIAN FAMILIES

Since about 40 per cent of the families in the study were Italian, the average dietary of the Italian group was computed and is given in Table 4. While Italians have certain dietary customs, such as the use of olive oil, their consumption of the various food groups was very close to that for all the families in the study, except that the supply of vege-

Type of Food	Pounds per Week per Male Unit				
	Home Relief	Work Relief	Weekly Income per Capita		
			Less than $4.00	$4.00 to $5.99	$6.00 or more
Protein Foods					
Milk—quarts	3.49	3.50	3.86	4.37	3.58
Total meat, fish, eggs, and cheese	1.68	2.32	2.32	2.89	4.05
Lean meat and fish	.97	1.62	1.62	2.19	3.02
Eggs	.54	.55	.59	.57	.84
Cheese	.17	.15	.11	.13	.19
Fats and Fat Foods—Total	.98	.75	.87	.99	1.44
Lard and substitutes	.04	.04	.08	.04	.06
Oil	.56	.33	.40	.46	.72
Bacon and pork sausage	.12	.15	.13	.13	.29
Butter	.26	.23	.25	.36	.36
Cream	0	0	.01	0	.01
Cereal Foods—Total	5.59	3.98	4.53	4.70	5.83
Flour and cereals	1.83	1.48	1.42	1.40	1.85
Bread	3.68	2.50	3.02	3.19	3.80
Cakes and pie	.08	0	.09	.11	.17
Sugary Foods—Total	.83	.79	.81	.82	.98
Vegetables and Fruits—Total	7.27	7.26	6.24	8.64	9.72
Potatoes	2.52	2.35	1.63	2.37	2.15
Tomatoes, canned—fresh	.83	.88	.82	.94	.98
Green leafy vegetables	.98	1.04	.91	.91	1.31
Other veg. canned—fresh	1.52	1.12	1.06	1.61	2.46
Dried vegetables	.07	.09	.01	.02	0
Fruits—canned or fresh	1.12	1.59	1.70	2.64	2.54
Fruits—dried	.23	.19	.11	.15	.28
Average calories per day	2,568	2,198	2,333	2,622	3,238
Number of families	29	15	33	23	13

Table 4. Average weekly consumption of various foods (per adult male) by Italian families of various income classes in New York City, May-June, 1933.

tables and fruits was low. The comments made above with regard to the differences in the diets of the various income classes would apply, in general, to the Italian families.

The consumption of tomatoes and green leafy vegetables by the Italian families compared very favorably with the averages shown in Table 2, and the relatively low consumption of the vegetable and fruit group was due chiefly to a lower consumption of potatoes and fruits. The Italian families seem to increase their consumption of fats, especially olive oil and sausage, when they have funds for a liberal diet, more than the other families in the study, but the increase in the use of sugars was less than that reported by the non-Italian families. However, there were only thirteen Italian families with more than $6.00 per person per week, which is too few to give very dependable indications of the dietary of this class.

CONSUMPTION OF MILK

Milk is such an important source of calcium and other substances essential to growth as well as a good source of efficient protein that the recommendation of a quart of milk a day for every growing child has become basic in planning diets. As stated previously, the milk consumption by any family is fairly regular and a week's supply may be taken as typical. Therefore, in Table 5, the use of milk by individual families is shown according to the quarts of milk per child 16 years of age or less. Most of the milk was fluid milk but evaporated and condensed milk are included.

The use of milk increased very definitely with income and nearly nine out of ten families in the highest income class had six quarts or more per week for each child 16 years of age or younger.

More relief families, both those on home relief and those on work relief, than non-relief families of lowest income reported less than six quarts per week per child.

It seems safe to conclude that most of these families use

fairly adequate amounts of milk when funds are available but when their incomes are reduced they tend to cut the milk supply too much to keep the diet "safe" for children.

SUMMARY

The average food budget for a week reported by low-income families residing in an East Side district of New York City indicated that:

1. Families with less than $4.00 per person per week had

Table 5. Milk supply per week of families in various low-income classes in New York City.

Income Class	Quarts of Milk per Week per Person 16 Years of Age or Less					
	Any Number	None	Less Than 3	3.0-5.9	6.0-8.9	9.0 or More
PER CENT OF FAMILIES USING SPECIFIED NUMBER OF QUARTS						
Home-relief families	100.1	0	14.3	41.1	17.9	26.8
Work-relief families	99.9	0	14.8	37.0	25.9	22.2
Income per capita per week						
Under $4.00	100.1	1.4	9.7	30.6	40.3	18.1
$4.00–$5.99	99.9	0	4.7	26.6	23.4	45.3
$6.00 or more	99.9	1.7	1.7	7.0	31.6	57.9
NUMBER OF FAMILIES						
Home-relief families	56	0	8	23	10	15
Work-relief families	27	0	4	10	7	6
Income per capita per week						
Under $4.00	72[1]	1	7	22	29	13
$4.00–$5.99	64	0	3	17	15	29
$6.00 or more	57	1	1	4	18	33

[1]In one family all children were over 16 years of age.

a diet yielding 20 per cent less energy value than the 3,000 calories per man per day recommended as a minimum for normal requirements by most nutrition authorities.

2. Families on home relief (food allowances) had a diet about 10 per cent below the standard for energy value and those on work relief a diet 20 per cent below the standard.

3. As income declined, the average consumption of each type of food in the dietary was reduced, but the greatest reductions were in the use of milk, meat, fish, eggs, and vegetables and fruits. The resulting diet lacks balance, and nutritional deficiencies are likely to occur according to standards for adequate diets approved by nutritionists.

4. The diet of the families on home relief contained much better proportions of the various nutrients than that of work-relief families or of families with less than $4.00 per capita per week, but the milk supply was somewhat below that recommended for a low-income diet.

A STUDY OF THE CHINESE POPULATION[1]

by CHI-MING CHIAO

~THIS paper comprises the first two chapters of Mr. Chiao's study. The remaining chapters will appear in the January and April issues of the *Bulletin*.

The author was born on January 27, 1898, at Ishih, Shansi, China. In June, 1924, he received his first degree, B.S., in Agriculture from the College of Agriculture and Forestry, University of Nanking. After graduation he served as an associate for five years and as an instructor for three years in the Department of Agricultural Economics, University of Nanking. He was in charge of the population project under the China Land Utilization population study now being conducted by the Department of Agricultural Economics, University of Nanking. He was granted a fellowship by the University of Nanking for study at Cornell University where he received the degree of Master of Science in 1933. —EDITOR

CHAPTER I

INTRODUCTION

CHINA is a large country, having approximately one-quarter of the population of the world. The number of her people was estimated by Professor W. F. Willcox[2] and Chang-hung Chen[3] in the papers presented at the Ninetieth Conference of the International Institute of Statistics at Tokio of Japan in 1930. Professor

[1]From the Department of Agricultural Economics of Nanking University, and the Division of Research, Milbank Memorial Fund. This study was made in cooperation with the Land Utilization Project financed by the China Council of the Institute of Pacific Relations. The author desires to give grateful acknowledgment to Professors W. A. Anderson, Dwight Sanderson, F. A. Pearson of Cornell University; to Professor J. Lossing Buck of the University of Nanking; and to Dr. Frank W. Notestein and Mr. Edgar Sydenstricker of the Milbank Memorial Fund for suggestions and assistance.

[2]Willcox, Walter F.: A Westerner's Effort to Estimate the Population of China, and Its Increase Since 1650. *Journal of the American Statistical Association*. New Series, No. 171, xxv, September, 1930, pp. 255-268; also Bulletin de L'institut International de Statistique, xxv, 3ème Livraison, La Haye—'S-Gravenhaye, 1931, pp. 156-170.

[3]Chen, Chang-hung: China's Population Problem. (Presented to the Nineteenth Conference of the International Institute of Statistics, Tokio, September 1930). For resumé of this discussion, see Bulletin de L'Institut International de Statistique, xxv, 1ère Livraison, Tokio, 1932, pp. 74-81.

Willcox estimated the population at about 350,000,000 and Mr. Chen at about 480,000,000. The difference of these two estimates is 130,000,000 persons. If we take earlier estimates of China's population, we find that the Official Census[4] in 1910 reported 342,639,000 persons and in 1912, 377,673,423 persons. In the year 1923 the Chinese Postal and Maritime Custom[4] estimates were 438,373,680 and 444,968,000 persons, respectively. According to the estimate of Professor Willcox, the population of China probably has not increased since 1910. According to the official Government estimates and those of individual Chinese students, the population of China has been increasing since 1910. Of the above estimates, which is more accurate? This is a difficult question to answer. But it is safe to say that an average of the estimates is probably more nearly correct than any one estimate. It is therefore probable that China has a total population of about 400,000,000 inhabitants. Since China has so large a population, the study of the composition and growth of this population seems important.

There are various opinions about the growth of population in China. Many prominent scholars believe that China's population is not increasing and perhaps is even decreasing, and that China will have no problem of over-population at least until the time the unsettled area, especially in the Northwest, is occupied. In general there is a common opinion among most of the middle-class people of China that the population of the other races and nations is increasing more rapidly than their own. Therefore a higher birth rate must be advocated or extinction will result. This superficial assumption results chiefly from the lack of available population data in China. Therefore, the purpose of this study is to

[4]Howard, Harry Paxton: Population Pressure and the Growth of Famine in China. *Chinese Economic Journal*, Iv, No. 3, March 1929. Published by Bureau of Industrial and Commercial Information, Shanghai, China, pp. 245-267.

help determine what the composition and the growth of the population of China really is.

METHOD OF THE STUDY

The data used in this study are a portion of the data collected in connection with the China Land Utilization Population study now being conducted by the Department of Agricultural Economics, College of Agriculture and Forestry, University of Nanking, and which is financed by the China Council of the Institute of Pacific Relations.

The method used in this study is the sampling survey method. The information was collected upon a prepared population and vital statistics schedule. For the purpose of collecting reliable data, the field investigator of each locality was chosen directly from the local community through recommendation of local leaders. After the right man was selected, he was carefully trained in the use of the schedules through actual field practice under the supervision of a regional investigator. For most of the localities, the regional investigator remained in the field until the work was completed and checked. One schedule was used only for each farm family. The number of schedules which were recommended to be collected in each locality was 600 or more. But for various reasons the number varied. The method of selecting the families in the chosen village was to obtain information from each family in the village or if only part of a village was surveyed, then each consecutive family on a street was taken. There was no personal choice or selection of families allowed in filling out the schedules in order to avoid the bias caused by improper sampling.

The information in the schedule covered the previous year's period, either a calendar year or a fiscal year, depending upon the time of year the data were gathered. From the

experience of many investigators, it was learned that when the survey started just after the Chinese New Year, use of the lunar calendar year was better because it was easier for the farmers to remember the past events from the previous New Year to the next. Otherwise, the fiscal year was used. The best date for a fiscal year was obtained by counting from a Chinese festival day of one year to the same festival day of the next year.

The survey method used in this study is shorter and quicker than the registration method. The information from one family for the previous year could be obtained in half an hour's time. Usually, the Chinese farmers remember quite clearly the details of the events which occurred in the family during the previous year. The number of births, deaths, marriages, and migrations were the big events of the year and the adults in the family could report this information very accurately. Sometimes even the neighbor families could report exactly the big events studied. The survey method, however, had its difficulties. Some points would be neglected either by the investigator or by the farmer. This difficulty was eliminated chiefly by preparing carefully organized schedules and instructions and by using well trained local investigators who would ask questions involving only a single idea in order to prevent the farmers giving useless information. The main trouble experienced in this study was the psychological reaction of the farmers. In certain localities the farmers did not wish to report their male babies for fear of some misfortune happening to the child. In some localities, false ages were reported for girls of marriageable age because the parents were reluctant to report their ages to other persons. These situations were hard to eliminate. The local investigator overcame these difficulties by watching, in so far as possible, very carefully the farmer's attitude in answer-

ing the questions. If the investigator judged the information to be unreliable, he eliminated this family.

A comparison of the survey method with the registration method is summarized as follows:

Registration Method	*Survey Method*
Registering the information when it occurred during the year.	Taking the previous year's information at one time.
1. Requires more time.	1. Saves time.
2. Expensive.	2. Inexpensive.
3. Information obtained through the whole year.	3. Information obtained in short period.
4. Usually registering one case at one time, hence fewer mistakes.	4. Recording all cases occurring during past year at one time, hence more mistakes by investigators and informants.
5. Errors caused by farmers' suspicion cannot be avoided in first few years.	5. Errors caused by farmers' suspicion cannot be avoided except by using some experienced local investigators.
6. Difficult to conduct at any time and at any place.	6. Easier to conduct at any time and any place.

From the above contrast of the two methods, it is observed that each has its advantages and disadvantages. The adoption of either method depends upon the nature of the institutions and uses of the material. If these materials are collected for a whole nation or a definite area by the government for a permanent record year after year, the registration method is suggested. If the information is secured at a given time in a typical region in order to study a specific population problem in one region or several regions, and the future con-

tinuous study in that area is indefinite, then the survey method is recommended. The accuracy of these two methods will be compared later in the discussion of the birth rate.

REGIONAL DISTRIBUTION OF THE DATA

The information in this study was collected from 22 typical localities in 11 provinces from a total of 12,456 farm families. This is probably a representative sample for different regions of China. The data in the tables are presented by three totals, the first total is the grand total for all these 22 localities and is indicated by the word "China." The second total is for North China in which 9 localities are included and the third total is for South China in which 13 localities are included. The boundary line between North and South China is the Hwai River (Fig. 1). The climate, soil, crops, and topography are quite different in each of these regions. Therefore, the mode of farm life is also quite different. Probably there are differences in the composition of the population in these regions. These are the reasons for making the two divisions, North

Fig. 1. Location of provinces and areas in China in which population studies were made.

Provinces and Hsiens in Which Studies Were Made	Year to Which Data Pertain	Number of Farm Families Studied
North China		
Hopei		
Tsang	Jan. 1929 – Dec. 1929	360
Nankung	Jan. 1930 – Dec. 1930	630
Shantung		
Wei	Feb. 1929 – Jan. 1930	368
Licheng	Jan. 1930 – Dec. 1930	597
Wei	Oct. 1930 – Sept. 1931	784
Shansi		
Tsingloh	Feb. 1929 – Jan. 1930	259
Honan		
Cheng	June 1928 – May 1929	1,124
Linchang	Nov. 1929 – Oct. 1930	458
Anhwei		
Su	Nov. 1929 – Oct. 1930	598
TOTAL		5,178
South China		
Hupei		
Hancheinan	Nov. 1929 – Oct. 1930	603
Anhwei		
Hwaining	Aug. 1929 – July 1930	379
Hoh	June 1930 – May 1931	788
Kiangsu		
Yenching	Nov. 1929 – Oct. 1930	600
Tai	Nov. 1929 – Oct. 1930	588
Kunshan	Feb. 1929 – Jan. 1930	609
Kunshan	June 1930 – May 1931	806
Chenkiang	June 1930 – May 1931	586
Kiangyin	June 1930 – May 1931	515
Chekiang		
Kinhwa	Jan. 1929 – Dec. 1929	290
Tetsing	June 1928 – June 1929	500
Fukien		
Lungki	Feb. 1930 – Feb. 1931	610
Kwantung		
Kityang	Feb. 1930 – Feb. 1931	404
TOTAL		7,238
TOTAL 22 LOCALITIES		12,456

Table 1. Sources of data by provinces and hsiens and years for which data were obtained, and number of farm families studied.

and South China. The distribution of the data by localities and by years, in which the survey was made, and by number of farm families studied is shown in Table 1.

This study compares, on the one hand, North, South, and China as a whole, and on the other, compares these data with those of other countries. It does not intend to study each locality in detail. The attempt is merely to indicate some general fundamental principles for the Chinese population.

Chapter II

THE CHINESE FAMILY

Before any attempt is made to describe the Chinese family, the definition of terms under this topic must be made. The term, "family" is used to include all relatives living and eating together. It may be a "joint family," which includes near relatives of the family head and his wife such as his brothers, brothers' wives and children, and parents, or it may be a small or natural family consisting only of husband, wife, and their children. The term "household" is used to include all relatives of the family head and all employees, or any others who are living and eating together in the same home during most of the year.

MEMBERS OF THE FAMILY

The head in the Chinese family is usually the male person who handles the purse of the family. Generally it is the eldest man in the family. For instance, if a family consists of two brothers, the elder brother will have the title of head. If their father is still living with them, the title will belong to him. But in case the father is unable to manage the family affairs due to old age or sickness, the title will be given to his eldest son. In China, no woman is recognized by the public as the family head, because in the Chinese family the man is considered more essential to the continuance of the male line for the practice of ancestor worship. Some widows act as the

family heads when their sons are very young, but the sons remain in name the heads of the families.

More than seventy kinds of relatives were found in the families included in this study. No one family had as many members as seventy different relatives. Each family contained certain combinations of relatives. What is the fundamental principle underlying such a family organization? In China, a married son seldom establishes a new home, but continues to live, with his bride, in the home of his parents. When his sons marry, they and their wives, in turn, live in the same household with their parents and grandparents. Thus a Chinese family may sometimes include several generations, from the great grandparents to the great grandchildren. In order to become thoroughly familiar with the composition of the Chinese family, the best way is to picture the extent to which different relatives were found in the families by the proportion of each type of relative in the total population.

In Table 2, the different relatives are grouped into three near genetic relationships, such as parents, family of the head and his descendants, and brothers' family and his descendants. It is found that for China as a whole about 85 per cent of the total population belongs to the immediate family of the head and his descendants, about 9 per cent to the family of the head's brother, and about 5 per cent to the family of the head's parents.

The Chinese family head lives more with his own descendants than with his brothers. The small proportion of parents of the head reflects simply the fact that the parent is usually the head. If either parent is alive, the children live with the parent. But in the absence of a parent, family disputes and disorganizations occur between brothers, because of the inability of their wives to agree. In order to maintain their own family harmony, brothers separate and maintain

Relationship to the Family Head	China	North China	South China
Parents			
Grandmother	0.2	0.2	0.2
Father	0.6	0.4	0.7
Mother	3.7	3.7	3.7
Stepmother	0.1	0.1	0.1
Mother-in-law	0.1	....	0.1
Father's brother	0.1	0.1	0.1
Father's brother's wife	0.1	0.2	0.1
TOTAL	4.9	4.7	5.0
Family of the head and his descendants			
Male head	17.2	16.1	18.1
Wives	15.6	14.4	16.6
Concubines	0.1	0.2	0.1
Sons	22.5	21.3	23.5
Sons adopted	0.3	0.2	0.4
Daughters	12.5	10.6	14.1
Daughters adopted	0.3	0.1	0.4
Sons' wives	6.5	7.7	5.6
Sons' fiancees	0.5	0.1	0.8
Grandsons	4.8	6.1	3.8
Granddaughters	3.6	4.5	2.9
Grandsons' wives	0.4	0.6	0.2
Great grandsons	0.2	0.3	0.1
Great granddaughters	0.1	0.2	....
TOTAL	84.6	82.4	86.6
Brother's family and his descendants			
Brothers	2.8	3.1	2.6
Sisters	0.8	0.6	0.9
Brothers' wives	1.6	2.1	1.2
Brothers' sons	1.6	2.3	1.1
Brothers' daughters	0.9	1.3	0.5
Brothers' sons' wives	0.4	0.6	0.2
Brothers' grandsons	0.2	0.3	0.1
Brothers' granddaughters	0.2	0.3	0.1
TOTAL	8.5	10.6	6.7
Total of Above Three Groups	98.0	97.7	98.3
Other Relatives	2.0	3.3	1.7
Grand Total	100.0	100.0	100.0

Table 2. Percentage distribution of family members in relation to the family head; 12,456 farm families, 22 localities, 11 provinces, China, 1929–1931.

their own homes. This results in the establishment of a larger number of small families made up of husband, wife, and their children. So it is natural that more family heads live with their own immediate family division than with their brothers.

Many years ago, the greater family system in China was encouraged by the government and supported by public opinion. The large families had several generations living together without any family division. The force which brought them together happily and peacefully was only the patient attitude of each person in the family. The people called such a family the model family. But at the present time the large family system is becoming very weak in many parts of China. The small family system is preferred. The chief reasons for this change are twofold. In the first place, family members now have more contacts with other communities than formerly in most parts of China. This situation encourages them to be more individualistic than before. So the local customs, traditions and mores, are losing their hold. In the second place, economic conditions have changed and now, as merchants, military officers, and laborers in the cities, many are receiving better economic returns than from farming at home. Naturally they desire a higher standard of living and more personal freedom. As a result, the desire is created, either to spend the money or save the money for their own wives and children. As a result the old family economic pooling system has become weakened.

Such conditions are more prevalent in South China than in North China because in South China communication is better and the cities are more prosperous. Many rural people leave the farms to seek a better job in the cities. For instance, in Nanking City, many men come from Northern Kiangsu and Anhwei to pull rickshas in the city. Likewise the farmers near Nanking go to Shanghai to be merchants and laborers.

All these factors contribute to the establishment of a family of close blood relatives in the rural districts. If we compare North and South China in Table 2, we find that South China has a higher per cent of people in the group of "the family of the head and his descendants" and fewer people in the group of "brother's family and his descendants." This indicates that the smaller family is in greater favor in South China than in North China.

When we study the composition of the family by relationship, we find that in the parents' group, mothers are more common than fathers. The reason is that in the Chinese families when the father dies the son becomes the head of the family. In the immediate group of the head of the family there is a larger proportion of sons than of daughters. This is due to the fact that daughters when married leave their own family and become members of that of their husband, as may be seen in the relatively large proportion of sons' wives.

Contrasting North China with South China, we find that South China has a higher percentage of male heads and their wives, sons, and daughters. This is probably due to the other relatives in this and other groups constituting smaller percentages. The higher percentage of daughters living at home in South China families is probably due to a higher marriage age than in North China. Sons' wives, grandsons, grandsons' wives, and granddaughters are found more often in the families of the North than of those of the South. The differences are probably caused by marriage at earlier ages, higher birth rates, and stricter adherence to the traditions of the large family in North China than in South China.

Concubines constitute 0.2 per cent of the population in North China families as against 0.1 per cent in South China. Concubines are taken largely because no sons have been borne by the first wife. Sons in the Chinese family are essen-

tial to the continuance of the male line. Upon them depends the proper worship of the ancestors. Family tradition in North China seems stronger than in South China. Therefore, in North China more male heads have concubines.

The custom of rearing a son's fiancee in the family of the person to whom she is betrothed was reported in almost every locality studied. For all China this betrothed group constituted 0.5 per cent of the family population but it was only 0.1 per cent in the North and was 0.8 per cent in the South. In the North, two out of nine localities reported no son's fiancees and the maximum per cent found in any locality was 0.5; in the South there was only one out of thirteen localities in which no fiancees were found and in Lungki, Fukien province, they constituted 3.7 per cent of the population.The differences in the adoption of this practice are explained in several ways. In general, those families practicing this custom are poor. This is true with respect to the immediate family of the girl, and also the family of the son for whom the wife is obtained. There is an economic advantage, resulting to both families. It means to the male head's family that when a son's fiancee is adopted that an additional family helper, either for household work or for farm work without payment of wages, is obtained. For the girl's family it means the reduction of one mouth for food consumption. Why is this system more prevalent in South China than in North China? It is probably partly due to custom and partly due to economic pressure. Usually, in South China marriage is not an expensive thing, since it is unnecessary for the family of the girl to ask for a large dowry. When the son reaches the age of marriage, he can marry if the family can support him and his wife. But this is not true in North China because the marriage is an expensive thing. Those families that have daughters hold them as valuable commodities in waiting for

a good market price. These values increase with increasing age. Therefore, in North China this practice of taking a fiancee occurs less frequently than in South China because the girl's parents can make money from her. It also creates the condition that girls in North China marry earlier than men. Many old men have never been married due to this economic factor.

SIZE OF FAMILY AND SIZE OF HOUSEHOLD

In Table 3, the size of farm families and of farm households is shown by the mean and the median size. For China the mean size of the farm family is 5.25 persons. The mean size of household is 5.42 persons. The median size of family and household is 4.48 and 4.49 persons, respectively. In North China the mean and median size of farm family and household is larger than in South China. It is therefore evident that there are more persons in the family and in the household in North China than in South China. The highest average size of family for any locality is 7.07 persons at Tsingloh, Shansi province, in North China and the lowest is 4.24 persons at Kunshan, Kiangsu province, in South China. The former is located in a mountainous region with poor communication and the latter is located in a fertile plain in in the Yangtze valley with good communication.

Table 3. Mean and median size of farm family and household; 12,456 farm families, 22 localities, 11 provinces, China, 1929–1931.

Region	Family		Household	
	Mean	Median	Mean	Median
China	5.25	4.48	5.43	4.49
North China	5.55	4.49	5.78	4.56
South China	5.03	4.20	5.18	4.39

The frequency distribution by size of families for the total of 12,456 farm families in China is shown by percentage in Table 4. When plotted, an asymmetrical curve results. It is due chiefly to some extremely large families which are found in both regions. Therefore, the curve has considerable skewness to the right of the mode. When we compare the two curves for North and South China, we find that in North China the skewness is greater than in South China. It could be said that in the North there are proportionally larger families than in South China (Fig. 2).

The frequency distribution of the American farm families of New York State for 1930 shows the same type of curve as in China but the deviation of skewness from the mode is smaller than for China. The modal size of the New York farm family is two persons per family. The median size of the farm families for all the families in the State is 3.31 per-

Table 4. Percentage distribution of farm families by size in comparison with rural farm families of New York State; 12,456 farm families, 22 localities, 11 provinces, China, 1929-1931.

Number of Persons in the family	China	North China	South China	New York State of U.S.A. (1930)
1	3.1	3.8	2.6	7.5
2	8.3	8.8	7.8	24.1
3	14.6	13.4	15.5	20.0
4	18.7	16.3	20.4	16.7
5	17.5	15.5	19.0	12.0
6	13.8	13.7	13.9	8.0
7	8.6	8.9	8.4	4.9
8	5.2	6.1	4.6	3.0
9	3.4	3.6	3.3	1.7
10	2.3	3.0	1.8	1.0
11	1.6	2.0	1.3	0.5
12	0.9	1.2	0.8	0.4[1]
13	0.4	0.8	0.2	...
14	0.4	0.7	0.1	...
15	0.4	0.7	0.1	...
16 and over	0.8	1.5	0.2	...
TOTAL	100.0	100.0	100.0	100.0

[1] 12 and over.

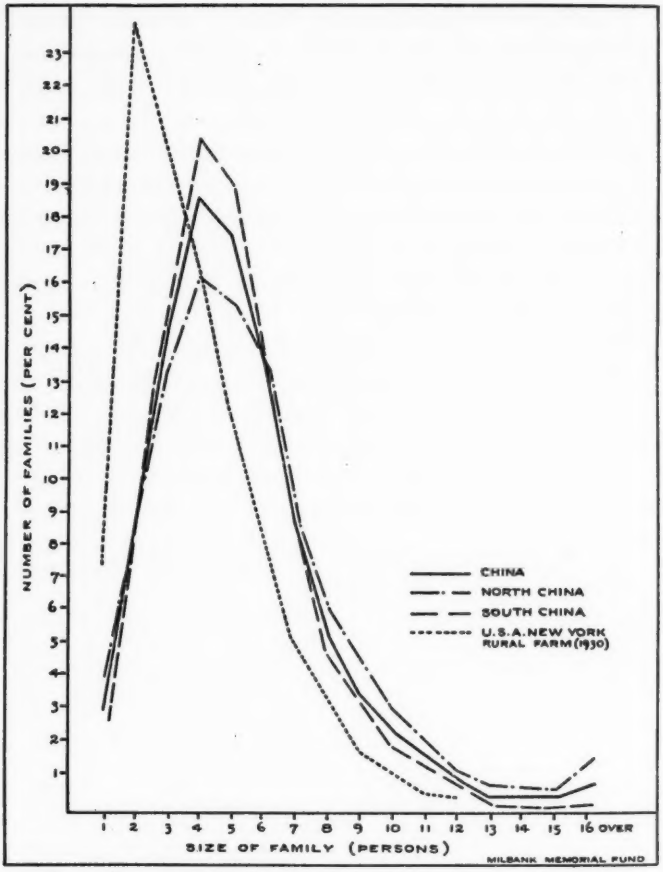

Fig. 2. Frequency distribution of size of the farm family (persons) of China and of the United States (New York State).

sons. The reasons for the smaller size of American farm families compared with the Chinese families are fourfold. First of all, the Chinese families practice the "joint family" system. The married sons seldom establish a new home, but continue to live, with their brides, in the home of their par-

ents. But the American married son almost always establishes a new home after his marriage. Secondly, there were probably many more rural people who left their homes to go to the city for work in America than in China as a result of the differences in the degree of industrialization. Differences in the extent of industrialization is the chief reason why China has about 80 per cent of her total population living on the farm while America has only about 24.6 per cent[5] in 1930. In the third place, the most important factor in reducing the size of American farm families is not only through industrialization in cities which pulls farm people from the farm but also the use of farm machinery on the farm, which causes many people in the families to find it necessary to migrate. Fourth, the rise in standard of living in American farm families may cause the people to reduce the number of children in the home.

In addition to all the other factors which may weaken the Chinese large family organization, there are other factors such as the size of the farm and the size of the family. The one given by Professor Buck is the most important. "Probably the increasing population in relation to a comparatively stationary tillable area is chiefly responsible for breaking up of the 'large family' system in rural China, thus bringing about an adjustment between size of farm and size of family."[6]

[5]Buck, J. L.: Chinese Farm Economy. Chicago, The University of Chicago Press, 1930, p. 335.

[6]Brunner, E. deS. and Kolb, J. H.: Rural Social Trends. New York, McGraw-Hill Book Co., Inc., 1933, pp. 17-19.

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